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Impact of commercial banking sector development on economic growth in small Pacific countries: A case study of the Vanuatu economy

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Lynette Ragonmal

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Abstract of a thesis submitted in partial fulfilment of the requirements for the Degree of Master of Commerce and Management.

Abstract

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Lynette Ragonmal

Apart from the positive and significant correlation between bank credit and development (King & Levine, 1993b), earlier studies by McKinnon (1973) and Shaw (1973) also documented the role of financial sectors in developing economies and identified struggling economies with least developed financial sectors which exhibit less minimization of asymmetric information and high transaction costs. A number of extensive literatures have highlighted the positive impact of financial development in developed countries on growth; however very little has been documented for small Pacific Island Countries with underdeveloped financial systems. An empirical analysis using time-series data from 1983 to 2013 is used in this study to investigate the impact of financial development through commercial banking on economic growth in Vanuatu. The model estimation includes unit root tests, checks for cointegration using the Johansen cointegration procedure, checks for Granger non-causality tests and investigating the short-run and long-run relationships using a Vector-Error-Correction Model (VECM). The results show that financial development has a positive and significant relationship (lagged by a two year period) with growth, reflecting the weak monetary policy transmission in under-developed money markets and financial systems. The causality test results show that a positive and significant short run relationship runs from financial intermediation to economic growth, and a long-run relationship exists between private sector credit and growth. In addition, the implementation of the Comprehensive Reform Program in 1997 has had little impact on growth as a result of the persisting hurdles to growth in small Island countries. This study offers opportunities for future reforms that will address sustainable financial development policies supporting growth.

Keywords: impact, small island country, financial development, economic growth, Ganger causality, Johansen cointegration procedure.

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Chapter 1

Introduction

1.1 Rationale of the Study

Little research has been carried out on the impact of the financial development on growth in Vanuatu and this empirical study examines the influence of commercial banking development on economic growth. A well-functioning financial sector can spur economic growth (Schumpeter, 1912 and Levine, 1997). The financial sector provides positive avenues in several fields which indirectly increase people's standards of living and reduce the poverty level. This study, however focuses on the possible effects of financial development on the income level, that is economic growth and economic development. Studies on developed countries with developed financial systems have concluded that a well-functioning financial system supports and enhances efficiency in the allocation of resources and stimulates the growth process (Merton, 1991).

There are several approaches to analyse the influence of financial development on economic growth. This study follows Levine's (1979) model which focuses on how finance is channelled from technological progress and capital accumulation to economic growth. A well-developed financial sector may increase investments, which can promote economic growth. Like other developing countries, the progress of financial development in small island countries in the Pacific is a gradual process, so therefore, it is of interest to investigate the impact of the current stage of development on Vanuatu's financial sector, its contribution to investment and whether it promotes economic growth. To investigate this problem, we use Schumpeter's, and King and Levine's (1993b) principles to identify the link between financial sector and economic growth for a small Pacific Island economy. According to Boyd and Prescott (1986), these principles identified two main important roles performed by financial intermediaries. Firstly, the financial intermediaries identify the best production technologies and reduce the costs of acquiring and processing information which improves resource allocation. Secondly, they boost the rate of technological innovation by identifying those entrepreneurs with the best chances of successfully initiating new goods and production processes. In general, commercial banks in Vanuatu follow these principles by both extending credit to the private sector and identifying the most successful entrepreneurs whose initial activities support growth. By identifying the effects of these channels through which finance affects growth, the results of the study will contribute to the literature on Vanuatu's financial sector development.

The definition of the financial sector includes mainly formal financial intermediaries in Vanuatu's financial system, specifically commercial banks that meet the definition of financial depository

institutions. The financial system is a channel through which financial development influences growth and sound financial system is characterised by healthy financial institutions and smooth, well-functioning financial markets which jointly allow for robustness and resilience in the face of adverse shocks (OECD, 2010; Estrada, Park, and Ramayandi, 2010). Access to financial services is another dimension of financial development, although it is not widely covered in this study. The lack of access to finance can be a serious barrier to investment and business growth and impedes the setting up of businesses essential for the growth of a dynamic economy.

Despite progress in financial intermediation, the pace of financial development continues to be hindered by the development problems and prospects faced by small island countries. The characteristics of small island countries include physical disadvantages, remoteness from world markets, a small domestic market, dispersion and narrow production bases which often raise significantly the costs of doing business (ADB, 2001). Winters and Martin (2004) show that most small economies have cost disadvantages in doing business and have significant difficulties in achieving or sustaining high levels of economic growth. In an inefficiently functioning banking system, it is harder for savings to be mobilised and normally accumulated outside the banking system where they are not effectively used for capital formation and growth of the economy. The commercial banks as part of a legal financial structure play a significant role in the transmission process. Therefore, financial development needs to bridge the gap between the formal financial institutions and rural households' financial needs (Levine, 2003). This study aims to investigate the contribution of Vanuatu's banking sector reform to the country's economic growth and development.

Commercial banking activities play a facilitating role in promoting economic development in developing countries. More than half of the population in the South Pacific countries are involved in traditional agriculture and subsistence farming (Agri-Trade, 2011). This portion of the population is often faced with an underdeveloped transport system, a critical shortage of capital and lacks initiative for enterprise development (Prasad and Roy, 2007; PSDI, 2014). In addition, other identifiable causes of the lack of investment include specific cultural, or social issues and government policies that raise the cost and risks of investment (Duncan, Sandy, & Malcolm, 1999). Commercial banks play an inclusive role in overcoming these obstacles and promote economic development through mobilising savings for capital formation by encouraging people to save through introducing deposit schemes, mobilising idle savings from the rich portion of the population and channelling them into productive investments, and creating support for capital formation of the economy (Rose, 1986). According to Rose, savings are a catalyst for capital formation, but equally a major determinant of the cost of credits is based on the law of scarcity, which holds that when the former are low and scarce, they becomes more costly to obtain. These financial institutions also finance the

industrial and agricultural sectors with short-term, medium-term and long-term loans. The financial system supports the economy by financing both internal and external trade through their overdraft facilities and issuing drafts by giving loans to retailers and wholesalers to stock goods. In the same way the support of commercial banks through advance loans to consumers in developing countries with low incomes for the purchase of consumable items could raise the standards of living of the people through loans for consumptive activities. Commercial banks play an important role and lead in following the mandates of the monetary policy of the central bank conducive for stable macroeconomic environment (Crockett (2001); Mishkin (2007)). Part of this role includes providing employment generating activities and entrepreneurial activities in the county by providing loans to productive sectors (UN-ESCAP, 2005). The importance of the banking sector to economic development makes the access to financial resources and services an important issue discussed by development and aid agencies in the Pacific and around the world. The Small Pacific Island States with underdeveloped financial systems have pressing needs to develop and institute financial solutions that can support rural household and business needs. In addition, the interest in financial inclusion has become important in financial development where the recognition of access to financial services (specifically their role in reducing poverty) and boosting shared prosperity becomes important in supporting inclusive and sustainable development (World-Bank (2014); PSDI (2014)).

The financial system provides a means of payment which underpins all economic transactions and provides a link between current and future output, and consumption. The World Bank highlighted the important role of commercial banks in the development process of developing countries through loans, investment, financial counselling and mobilising local capital and channelling it into new and expanding business (World-Bank, 2008). A well-functioning financial system serves a vital role by offering saving, payment, credit and risk management services to individuals and firms. Financial market frictions make it harder for people in rural areas to invest in education and opportunities for employment. Banerjee and Newman's (1993) nonlinear model study shows that occupational choices of individuals (to become entrepreneurs or remain as wage earners) are limited by initial endowments. These occupational choices determine how much each individual can save and what risks they can bear, with long-run implications for growth and income distribution.

This study investigates the impact of financial development on the economic development using Vanuatu as a case-study of a small island country with developing financial systems. Financial development can be defined as increased access to financial resources made available through banking reforms to the latest new innovative banking services initiatives such as mobile banking, micro-lending and savings (Levine, 1997).

1.2 The background of Vanuatu's economy

Vanuatu is an archipelago nation consisting of 83 islands situated in the southwest Pacific Ocean, with a total land area of 12,336 square kilometres and an exclusive economic zone of around 700,000 square kilometres. It has a population of approximately 234,023 people of whom two thirds live in rural areas(VNSO, 2009), engaging in subsistence farming and supplementary cash crop production. The service sector, which makes up almost 60 percent of the country's Gross Domestic Product (GDP), is heavily concentrated in the two urban towns of Port Vila and Luganville, situated in two different islands. The scattered dispersion of the islands makes infrastructure development difficult and costly. Furthermore, the country is prone to natural disasters such as tropical cyclones (constantly faced by countries in the Pacific region) (ADB, 2001).

The internal and external characteristics specific to Vanuatu make it a good case study of a developing financial sector. It is characterised by specific features such as its colonial history, the country's government initiatives, tourism development and other features of the local economy. Although the colonial heritage of Vanuatu is similar to other South Pacific Island Countries, its colonial rulers never introduced direct taxation following independence in 1980. Some of the government initiatives from 1992 to early 2000 included moving the country forward with Offshore Financial Centres (OFCs) (ADB, 2002; Jayaraman, 2003). Vanuatu also has no exchange control and there are strict secrecy provisions, ensuring confidentiality of all operations of exempt companies. Exempt companies are set up under the Companies Act (Cap 191) to do offshore work and their business is carried on outside Vanuatu, providing no trading within Vanuatu except with another exempt company and as a result, they attract financial capital into the country. At the same time, the government of Vanuatu has made tremendous efforts to support and promote tourism, the country's second engine of growth. Commercialisation of agriculture through the development of cash crops, fishing, small-scale eco-tourism and forestry is expected to develop many value-added activities in the agriculture sector. However, as Jayaraman (2003) highlighted, it remains a challenging task to promote commercial agriculture among subsistence-oriented farmers in remote islands, as it involves transforming a traditional society with rich cultural values of common land ownership into a competitive society. These are some of the development challenges shared by developing small Pacific Island economies such as Vanuatu (Knapman et al. (2001); ADB (2002); Prasad and Roy (2007)).

The banking activities in Vanuatu are largely confined to urban centres where formal sector activities are heavily concentrated. An Asian Development Bank (ADB) country report noted that the assets of the four commercial banks accounted for over 83 percent of the total assets of Vanuatu's financial sector in 1999. Foreign banks dominated the banking sector and accounted for more than 94 percent of the total assets of the financial sector in 1999, while the only Government-owned National Bank of

Vanuatu (NBV) accounts for less than 6 percent (ADB, 2001). Commercial banks have increased their market share as a result of the merger of the Development Bank of Vanuatu into the government-owned bank, National Bank of Vanuatu in 1998 (ADB (2001); ADB (2002)). The financial deepening[1] process of the financial sector over the period has been slow and this is related to the minimal development of the financial system where savings and time deposits are the only likely options for savers to invest in(Jayaraman & Choong, 2012). Commercial banks' claims on the private sector in vatu terms increased from 31 percent in 1995 to 32 percent in 1999 reflecting the fairly low level of financial intermediation (ADB, 2002). In a study by Yang, Davies, Wang, Dunn, and Wu (2012), domestic money markets measured by the ratio of broad money (M2) to GDP were quite shallow. This, along with other characteristics of under-developed domestic financial markets in Pacific Island countries, includes limited markets for commercial papers, corporate bonds and foreign exchange products. Collateralised inter-bank lending is not widely available with non-existent secondary markets for government and central bank paper. This under-developed state of the financial markets affects not only the interest rates and credit pass-through, but also other channels of monetary policy transmission (Knapman et al. (2001); ADB (2001); Yang et al. (2012)).

1.3 Research Problem and Objectives

Does formal financial development matter for economic growth in small island economic development? With the vast collection of documented literature supporting the positive contribution of finance to growth in general, what is the impact of financial development in terms of commercial banking development on the overall growth and major economic sectors of Vanuatu? What are the challenges associated with financial development for small island countries? The current study aims to investigate the relationship between financial development (specifically commercial banking sector development) and economic growth in Vanuatu.

The specific objectives are:

1. To investigate the relationship between Vanuatu's formal financial sector development and economic growth;

2. To identify the contribution of existing major financial sector development reforms on major economic sectors of Vanuatu's economy; and

3. To identify the main problems and challenges involved in financial sector development in Vanuatu, and to provide implications and recommendations to relevant policymakers and players in financial sector development.

[1] The rate of increase in liquid money in the economy that provides more opportunities for continued growth.

1.4 Significance of the study

King and Levine's (1993a) paper laid the foundation for empirical assessment of the finance-growth relationship followed by many new stylized facts and challenges discovered in the finance-economic growth literature. These included studies of developed countries with developed financial systems on the finance-growth relationship and how loanable funds promote economic activity. Their findings showed how various measures of the level of financial development are strongly associated with present rates and future rates, the real per capita GDP growth and the rate of physical capital accumulation. Early studies by McKinnon (1973) and Shaw (1973) provided valuable insights into the role of financial sectors in developing economies. The authors identified that struggling economies with least developed financial sectors have less minimisation of asymmetric information and high transaction costs due to divisive regulation, inadequate infrastructure and macroeconomic control with low performance. Recent studies have focused on large developed nations with developed financial systems during the structural shifts in the world economy in the early 1900s. Greenwood and Jovanovic's (1990) model highlighted the dynamic interactions between finance and growth whereby, if capital is scarce, financial intermediaries that produce better information on the firms will therefore fund more promising firms inducing a more efficient allocation of capital. King and Levine (1993b) found a positive and significant correlation between bank credit and development, a faster economic growth and a positive influence of financial liberalisation on bank efficiency in reducing intermediation costs. The next stage of the finance-growth nexus was built up on the core research by Schumpeter (1912) which highlighted finance in the process of economic development. Schumpeter's monograph published in 1912 on 'The Theory of Economic Development' identified five forms of combinations that drive economic development through bank loans (Schumpeter, 1912). Recent studies have also shown that financial intermediaries also boost the rate of technological innovation by identifying those entrepreneurs with the best chance of successfully initiating new goods and production processes (Galetovic (1996); Morales (2003); Acemoglu et al. (2003)). This highlighted that banks are an important intermediary between investors and borrowers.

The importance of the banking institutions was not realised well during the recession following WW1 leading up to 1934, where processes from the real economy were considered as first-priority and a matter of 'enterprise leading finance' (Robinson, 1952), thus reflecting the absence of work dedicated to the finance-growth nexus in the 1930-1940s. The works of other seminal authors focusing on the finance-growth nexus began to emerge in the period from 1950 to the 1980s and supported by Gerschenkron (1962). They focused particularly on the role of the banking sector associated specifically with the huge scale of capital required for investment.

The causality and correlation relationship was further highlighted in many studies. Patrick (1966) highlighted two ways of looking at financial development and economic growth and brought out the

causality in the finance-growth nexus literature, first through 'demand-following' where finance is required to attract external financing in terms of supporting economic growth. On the other hand, 'supply-leading' takes place when financial institutions accumulate savings and transform them into investments which are necessary for the development of modern sectors of the economy. Goldsmith (1969) who was largely successful in documenting the evolution of national financial systems and intermediaries highlighted that economic growth can be financed through the increase in effectiveness and build-up of the aggregate volume of investments using the ratio of financial assets to GNP and GNP per capita for 35 countries. The author documented a positive correlation between financial development and the level of economic activity in the countries studied. Goldsmith's analysis presented evidence that banks tend to become larger relative to national output as the countries develop.

In later literature, Rousseau and Wachtel's (1998) study showed that financial development enhances long-run economic growth in the early stages of industrial development. Levine, Loayza, and Beck (2000) demonstrated that omitted variables, simultaneity or reverse causality do not alter the main finding of a positive correlation between financial intermediaries' development and growth. Considering these individual effects, Benhabib and Spiegel (2000) also showed empirically that estimated growth equations under the framework of both neoclassical and endogenous models revealed that financial development (deepening) indicators are positively correlated with total factor productivity growth and investment. These findings support the functions of financial institutions as positively and strongly fostering a country's economic growth and development.

Despite the positive impact of financial development on growth for well-functioning financial systems, there are a number of factors constraining the access to credit and financial services for borrowers in underdeveloped financial systems like Vanuatu. These constraining factors are related to the structure of the financial system, where in some cases, obtaining collateral can be difficult. For example, land titles cannot be transferred easily because they are inefficiently small and shared by too many stakeholders, especially land disputes with customary titles, which cannot be negotiated as a lease (Hariharan & Marktanner, 2012). Similarly, with a smaller economic base, banking services are not offered widely owing to the lack of economies of scale and high operational costs. Banks take operational costs into major consideration when deciding whether or not to serve remote or sparsely populated areas. This raises the importance of financial development in which the lack of financial inclusion is costly to society and the individual, which forces the un-bankable segment of the population into informal credit sectors where interest rates are higher and the amounts of available funds are smaller. Since the informal credit structure is outside any legislative framework, any dispute between lenders and borrowers cannot be settled legally (Hariharan & Marktanner, 2012). The situation is made worse for farmers who are pushed into borrowing funds for fertilizer,

machinery and seeds at the beginning of the growing season and have great difficulties in repaying after the harvest, specifically during periods where there is a natural disaster and production and income are both below expected levels during harvest. Hariharan and Marktanner (2012) also show that although structural adjustment programs and financial market reforms have been introduced in developing countries, these markets have largely failed to reach large segments of the society. This is often associated with related fixed costs which serve as a market barrier that prevents the financial inclusion of certain segments of the society. Chibba (2009) explicitly reports the lack of financial inclusion in the case of Botswana where poor governance in areas such as monetary policy, land ownership, public sector agency government, government procurement and the legal and regulatory framework form barriers for most rural households' borrowing.

A vast number of studies have been conducted on developed financial markets, but there is limited study conducted on the impact of financial development on economic growth in small island countries with underdeveloped financial systems. Merton (1995) noted that the basic functions of a financial system are essentially the same in all economies, the most efficient structure for fulfilling the functions changes over time, and differs across geopolitical divisions for a variety of reasons – differences in size, complexity, and available technology, as well as differences in political, cultural and historical backgrounds. Our study addresses the gap in the literature in the area of financial system development and the financial sector in small South Pacific Island Countries. The study attempts to identify that if the support for financial sector development conducive to growth has been successful for developed countries, then the impact of reforms for small developing countries could be pronounced. The findings from this study will be useful for commercial banks and the Reserve Bank of Vanuatu for development policies that support financial development in areas of accessibility to financial resources and services and promoting financial inclusion by increasing the participation rate of rural people in major economic sectors.

There are gaps in the studies on developing countries since they continue to face a lack of high-quality data representative of major indicators in bank finance data. This area continues to lack sufficient rigorous analysis, therefore filling this gap is important in order to support poor and developing countries to develop effective development policy reform (Rousseau & D'Onofrio, 2013). The limited research in this area in the Pacific region makes these reforms even more difficult because of the uncertainty surrounding it. However, filling this gap should help give a better view of the relationship between finance and growth in Vanuatu, not only the direct laws, regulations, and macroeconomic policies shaping the financial sector, but also the political, cultural and geographic contexts shaping financial development.

This study briefly looks at the micro-macro links which provide the benefits in understanding the key constraints on financial development in low-income countries like Vanuatu, how banks in Vanuatu

function and their loan distribution per sector. It could provide opportunities for future research focusing on how financial structure reforms are fostered and the challenges faced in the domestic financial system. Further research could also address the technology aspects of financial development which are suitable for Vanuatu with low savings and population density, and where new forms of technology such as mobile banking, internet banking and Automatic Teller Machines (ATMs) can have a great impact.

1.5 Structure of the study

The rest of the thesis is organised as follows. Chapter 2 starts with a review of earlier literature, such as theories of growth and the relationship between the financial sector development and economic growth. A brief outline of the way the subject has been analysed, and the conclusions of previous studies are then presented. The chapter also covers the literature and facts about the structure of Vanuatu's economy and its financial sector and financial development. Chapter 3 discusses the data and methodology and the econometric analysis and results are presented in Chapter 4. Chapter 5 concludes the study.

Chapter 2

Literature Review

This chapter begins with an introduction of the previous studies carried out by seminal authors and researchers in the area of finance-growth. Section 2.2 introduces an overview of the theoretical framework and channels that link financial development to economic growth and discusses the indicators used in previous studies. Section 2.3 presents previous empirical studies on finance and growth theories and their findings. Sections 2.4 -2.6 summarise the preliminary facts and descriptive statistics from the literature on Vanuatu's economic background, the financial structure and the correlation between Vanuatu's financial development and economic growth.

2.1 Review of related literature

The influence of financial system development on growth and the role it plays through its impact on savings and investment are well documented. Financial institutions, financial instruments and financial markets arise to remove the effects of information, enforcement and transactions costs. How efficiently the financial system is able to reduce these costs has enormous and widespread effects on savings and investment decisions, technological innovation, and ultimately on per capita GDP and productivity growth rates. Apart from financial institutions' main task of producing and disseminating information about investment projects and allocating resources, they also monitor these investments and manage and diversify these investment risks. At the same time, the financial systems such as commercial banks, mobilise savings and ease exchange (King & Levine, 1993a).

Cihak, Demirguc-Kunt, Feyen, and Levine (2013) show that low-income countries' financial systems are internationally comparable in terms of stability. As for financial depth, low-income countries are about a fourth of those in high (lower-middle) income countries, while in terms of financial efficiency these ratios are half and two-thirds and regarding financial access a tenth and a quarter, respectively. Such aggregate measures show that financial depth is far from being the only important issue for low-income countries, with efficiency and access as more pressing issues.

A growing body of literature including that of Rousseau and Wachtel (1998), Levine et al. (2000), and Knapman et al. (2001), demonstrates a strong positive link between financial development and economic growth, and Levine (1997) provides evidence that the level of financial development is a good predictor of future economic development. Empirical studies have established that there is a positive relationship between the financial sector development (banking sector development) and economic growth (Levine, 2005). This was initially influenced by Schumpeter (1912) whose work identified a 'new combination' of concepts for entrepreneurs used in economic development. In his

book, “The Theory of Economic Development”, Schumpeter (1912) emphasised that economic development in a market economy is evidenced specifically through the means of administrative power and bank loans. It raises the important emphasis on the role played by entrepreneurs who, according to Schumpeter, in many cases use stocks of capital supplied through the mechanisms of credit by capitalists and bankers. Other seminal works in this field include Gerschenkron (1962) whose work focused on determining the role of the banking sector during the industrialisation process. Furthermore, Patrick (1966) and Goldsmith (1969) discussed the finance-growth relationship and identified two ways of looking at the financial development and economic growth relationship specified as “demand-following” and “supply-leading”. These set the theoretical framework on the study of financial development and economic growth. There is also evidence that the level of financial development is a good predictor of future economic growth, capital accumulation and technological change that can crucially affect the speed and pattern of economic development (Levine 1993).

Studies on the Pacific Island financial sector are limited to a few studies by Jayaraman (2003) and Pacheco (2007). Pacheco’s study on the pro-independence reform of Vanuatu’s financial system following the Comprehensive Reform Program implementation revealed that foreign banking institutions were not particularly interested in broadening credit access to the poorer sections of the population and that high levels of state dependence hindered the development of a sustainable micro-credit sector. However, the rise of a few civil society organisations in Vanuatu has significantly increased economic democracy and participation among the local residents. This has been regarded as the best practice for the country in supporting the local communities.

One issue associated with the focus on low-income countries is how financial development emerges. If financial development is an important pre-condition for low-income countries, a study of the type of financial system structure conducive for growth (for example the role of commercial banks) or a study of the crucial role played by capital flows could be further investigated in these countries. Furthermore, further research into the role of foreign aid (and the donor community) in shoring up financial development in poorer countries; identifying whether foreign aid plays a role in changing the structure of domestic financial systems in poorer countries; and identifying how financial development connects economic and political elites can provide avenues in supporting financial development policies. For example, Nkusu and Sayek (2004) empirically highlighted that developing local financial market depth through financial sector reform enhances aid effectiveness. These studies may stimulate authorities and policymakers to carry out financial liberalisation and structural reforms if necessary. While it may require a substantial data collection effort, findings from related empirical studies such as those of Campos and Kinoshita (2008) point to the direction in which financial sector reform may be a key factor in enhancing the benefits of foreign capital inflows

specifically for developing countries, in particular, financial liberalization and privatization. These studies by Nkusu and Sayek (2004) and Campos and Kinoshita (2008) illustrated how efforts for successful financial liberalization and structural reforms fostered by the domestic financial system may support aid effectiveness and foreign direct investment. Another aspect concerns the micro-macro link in the institutions which may prove crucial to understanding the key constraints on financial development in low-income countries.

Access to financial resources and services plays an important role in economic development; however whether 'inadequate' financial development has an impact on economic growth is questionable. Although studies such as those of Goldsmith (1969), King and Levine (1993b), Aghion, Howitt, and Mayer-Foulkes (2005) and Levine (2005) show a positive relationship between financial development and economic growth, economists hold different views on the existence and direction of causality that exist between financial development and economic growth. The first is the "supply-side" view, which states that financial development has a positive effect on economic growth. According to this view, financial intermediation contributes to economic growth through two main channels: (1) by raising the efficiency of capital accumulation and in turn the marginal productivity of capital (Goldsmith, 1969) and (2) by raising the savings rate and thus the investment rate (McKinnon (1973); Shaw (1973)). In other words, by increasing the size of savings and improving the efficiency of investment, financial development leads to higher economic growth. The second view of the relationship between the two variables was advanced by (Robinson, 1952) who stated that financial development follows economic growth or "where enterprise leads finance follows". According to this "demand-following" view, as the real economy expands, its demand for financial services increases, leading to the growth in these services. Empirical support for both views can also be found in recent studies (Demetriades and Hussein (1996); Christopoulos and Tsionas (2004)). Expansion of the financial system may be induced by a higher per capita income due to increased demand for financial services. This is based on Robinson's (1952) hypothesis that more financial institutions, financial products and services will emerge in response to the greater demand for financial services when an economy expands. This implies that the level of real economic activity critically affects financial development.

McKinnon (1973) and Shaw (1973) took a different view on how the financial system regulation and its framework, particularly interest rate ceilings, may distort the economy in several ways. First, it may discourage entrepreneurs from investing in high risk but potentially high-yielding investment projects. Second, financial intermediaries may become more risk averse and offer preferential lending to established borrowers. Third, borrowers who obtain their funds at relatively low cost may prefer to invest only in capital intensive projects. McKinnon (1973) and Shaw (1973) argued in favour of liberalising the financial sector by way of removing interest rate controls and allowing the market

to determine its own credit allocation in order to deepen the financial systems. On the other hand, other arguments suggest otherwise, for instance, with deposit insurance, the absence of interest rate control may result in overly risky lending behaviour among banks. Stiglitz (1994) opposes the view that interest rate restraints may lead to higher financial savings in the presence of good governance in the financial system. When depositors perceive restrictions as policies aimed at enhancing the stability of the financial system, they may be more willing to keep their savings in the form of bank deposits thereby increasing the depth of the financial system. On the other hand, the rapid changes in the financial sectors as a result of deregulation, technological innovation and new financial products have contributed to financial and economic development (Levine, 1997).

2.2 Theoretical framework surrounding the financial development and economic growth relationship

Levine (1997) highlighted in his work that the level of financial development is a good predictor of future rates of economic growth, capital accumulation and technological change. Financial instruments, markets and institutions arise to mitigate the effects of information and transaction costs. Finding ways to reduce transaction costs influences saving rates, investment decisions, technological innovations and the long-run growth rate of the economy. In the same way, innovations in telecommunications (such as internet banking) and technological changes (the use of EFTPOS and Automatic Teller Machines) have affected the financial services industries and the way commercial banks deliver services to their clients (Claessens, Glaessner, & Klingebiel, 2000). The works of Schumpeter (1912) point out that a well-functioning financial system encourages technological innovations by increasing funding to entrepreneurs which ultimately leads to economic growth that establishes the link between the functioning of the financial systems and economic growth. These findings also include firms and industries that rely heavily on external financing and grow disproportionately faster in countries with well-developed banks and securities than in countries with poorly developed financial systems.

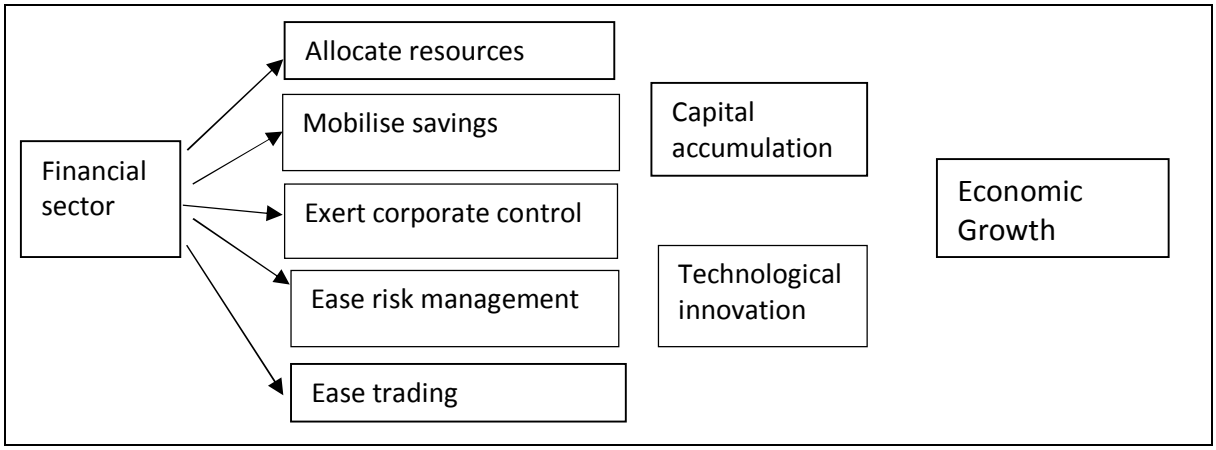
In addition to many other important aspects, the performance and long-term economic growth and welfare of a country are related to its degree of financial development. Financial development is measured by factors such as the size, depth, access, efficiency and stability of a financial system. This includes markets, intermediaries, range of assets, institutions and regulations (World-Economic-Forum, 2012). Financial intermediation and financial markets contribute directly to economic growth and aggregate economic welfare through their effects on capital accumulation (the rate of investment) and technological innovations. First, greater financial development leads to greater mobilisation of savings and its allocation to the highest-return investment projects. This increased accumulation increases economic growth. Second, by allocating capital to the right investment projects and promoting sound corporate governance, financial development increases the rate of

technological innovation and productivity growth, further enhancing economic growth and welfare (World-Economic-Forum, 2012).

The financial sector can be developed in many different ways, such as with improvements in the efficiency and competitiveness of the sector (ADB, 2015). The range of financial services that are available may increase the diversity of the institutions which operate in the financial sector; the amount of money that is intermediated through the financial sector may also increase, along with the extent to which capital is allocated by private sector financial institutions to private sector enterprises. The regulation and stability of the financial sector may improve, and more importantly the improvement in access to financial services is considered important from a poverty reduction perspective (World-Bank (2011); ADB (2015)).

Modern growth theory identifies two specific channels through which the financial sector might affect long-run growth: (1) through its impact on capital accumulation (including human as well as physical capital) and (2) through its impact on the rate of technological progress (Levine, 1997) (see Figure 2-1). Theil (2001) noted a very simple growth model that illustrates the three important connections between financial variables and economic activity via the so-called AK model ($Y_t = . K_t$; where Y_t is output in period t produced by capital K_t, and A symbolises capital productivity). This model assumes that an efficient financial system reduces the loss of resources required to allocate capital and can be used to derive the optimal size of the financial system (Theil, 2001). The more efficient the transformation of savings into investment, the lower the loss of resources and the more the savings can be used for productive investments. This positive feedback effect between finance and growth is demonstrated in Harrison et al's (1999) study.

Figure 2 1 Theoretical Framework. The Channels of Financial Development Influencing Economic Growth



Source: (Robinson, 1952); (Levine, 1997); (Theil, 2001)

The positive feedback effects through the credit and investment channels on the finance-economic growth relationship is evidently productive in mobilising savings for investment, facilitating and encouraging inflows of foreign capital (including FDI, portfolio investment and bonds, and

remittances), optimising the allocation of capital between competing uses, and ensuring that capital goes to the most productive use (FitzGerald, 2006). In this regard, Levine (1997) identified five basic functions of financial intermediaries which give rise to these positive feedbacks effects in this channel: (1) saving mobilisation, (2) risk management, (3) acquiring information about investment opportunities, (4) monitoring borrowers and exerting corporate control, and (5) facilitating the exchange of goods and services (Figure 2-1).

Mobilisation of savings could be an important function of the financial sector in developing island countries with developing financial systems. The provision of saving facilities or transaction bank accounts enables households to store their money in a secure place, and allows money to be put to productive use. Bringing savings into the financial sector where they can be utilised productively could itself make a significant contribution to growth in the country, in particular, the productivity growth and capital accumulation channels. The returns on investment can create positive expected returns for the savers, which may in turn increase savings. At the same time, credit may also be made available to finance investment in education or health, and can thus promote the accumulation of human capital (De-Gregorio, 1996). Financial institutions may also increase the rate of technological progress by identifying and thus allocating capital towards those innovations with the best chances of succeeding (King & Levine, 1993b).

Researchers have also identified limitations in the methods of investigating the relationship between financial development and economic growth. The problem associated with the types of cross-country studies is that they generate estimates of the average effects of financial development, while the relationship may vary considerably among countries. On the other hand, the political, economic and institutional diversity that build up the financial system differs for different countries(Al-Yousif, 2002). As a result, a number of authors have extended their studies to examine the finance-growth relationship using time-series data on individual countries, and thus have found that the nature of the relationship can indeed vary among countries. Therefore, caution should be used in making generalisations about the likely benefits arising from Financial Sector Development (FDS) in any particular country compared to developed countries. The weight of the evidence shows that FSD does make an important contribution to growth in most countries in the developing world (Esso (2010); Hassan, Sanchez, and Yu (2011); Pan and Wang (2013)).

Insufficient financial development could lead to the high-cost structure of small island countries as noted by Berthelemy and Varoudakis (1996) that may leave a country in a 'poverty trap'. They argued that a vicious cycle can be created where low levels of financial intermediation result in only a few market players. The lack of competition results in high costs, leading to low real deposit rates and hence low savings, which in turn limits the amount of financial intermediation.

Previous studies conducted by International Aid Agencies, the International Monetary Fund (IMF) and the Asian Development Bank (ADB) on the relationship between financial development and growth have brought together a broad consensus that finance plays a crucial role in the process of growth. It does that through a variety of mechanisms: reducing the cost of capital to firms, by allocating capital more efficiently to entrepreneurs, and by encouraging greater competition among non-financial firms (Khan & Senhadji, 2000). These support the benefits of financial development.

2.2.1 Access to financial resources and services as part of financial development

Apart from their vast cultural diversity, a main feature of the developing countries, typical of small island countries with underdeveloped financial systems, is the existence of unorganised money markets that reflects the importance of traditional cultural practices and communal ownership of assets. The unorganised money markets do not help in the accumulation of capital funds, neither can their financial assets be used and invested in those areas where the need for development is the greatest. They tend to remain isolated from other money markets, centring on indigenous banks or money lenders and possess strong regional characteristics. This type of weak financial intermediation is dominant in the rural and a few urban areas and can result in insecurity of debt contracts (ADB, 2002). The Indian money market is an example of such financial markets where indigenous bankers constitute a larger portion of the money market contributing to the weakness in the financial sector (Sinha, 2015).

The commercial sector becomes an important sector in lending because there is sufficient credit and security, and the capital is invested for a short term (usually less than one year). The biggest task for financial development in underdeveloped countries is the accumulation of domestic capital and its investment as capital for the industry. In order to establish an organised money market, such measures can only be established through the establishment of new banks, increases in branch offices, making banking facilities available throughout the nation, or raising interest rates to support savings. Increased capital formation cannot be achieved by mere financial and fiscal techniques alone, but also movement of people's savings (Aryeetey & Gockel, 1991). Owing to the impediments to access to finance, developing small island states do not have a saving propensity under their social and economic conditions. Therefore, economic development should be supported with active savings.

2.2.2 Financial development indicators

The common indicators used in empirical studies to investigate the finance-economic growth relationship include the total credit to the economy termed as an appropriate measure of financial development (Levine et al. (2000); Abubakar and Gani (2013)). This monetary aggregate is a traditional proxy of financial development and deepening (Lynch, 1996). It supports the mobilisation

of savings to facilitate transactions, provide credit to producers and consumers, reduce transaction costs and fulfil the medium exchange function of money. The ratio of liquid liabilities to GDP (indicated as M3/GDP) was used as a measure of financial depth; however Levine and Zervos (1998) argued that the use of this indicator limits the identification of where the financial system allocates capital. Despite its widely used measure, Levine and Zervos also argued that increases in M3/GDP as a measure of the liabilities of banks, the central bank and financial intermediaries are not necessarily associated with increases in credit (one aspect of financial development that might generate economic growth). Therefore, our study will include other proxy measurements that can be used to identify the development of the formal financial sector in Vanuatu, such as the ratio of total financial assets of the commercial banking system to GDP as a proxy indicator for financial system development, the ratio of private sector credit to GDP as a proxy indicator in measuring the development of financial intermediaries, and commercial banks' average interest rate spread as a proxy indicator for efficiency or accessibility of financial intermediaries. Lynch (1996) also identified that various other monetary aggregates, namely broad/money and bank deposits as quantity measures, are more reliable across time in a country than across countries. Most importantly, Lynch indicated that financial intermediation transaction costs cannot be evaluated accurately in individual countries and cannot be compared across countries, owing to differences in variables ranging from financial sector design to population dispersion. Alternatively, bank interest rate margins are another indicator often used to estimate the intermediation transaction costs (Lynch, 1996).

2.3 Empirical Background

The empirical literature on finance and growth is supported by cross-country growth regressions, time-series analyses, panel-data studies, industry and firm-level studies, and historical evidence. In their study of the finance-growth relationship, Berkes et al. (2002) highlighted that the relationship between finance and growth seems to be causal and unidirectional, from finance to growth. There are five recent findings that are worth mentioning. First, the long-run effect of finance on growth is indeed positive and dominates the short-term effect that tends to be negative. The second is that the relationship is non-linear. Beyond a certain threshold (calculated to be above 100% of GDP) finance is associated with negative growth. In terms of distribution, a third finding shows that household credit seems to have small growth payoffs, while private sector credit has large growth payoffs (Barajas, Beck, Dabla-Norris, & Yousefi, 2013). Fourth, financial development reduces income inequality and exerts a disproportionally positive impact on the bottom quintile. Fifth, different financial liberalisation policies have contrasting effects on income inequality.

A gap in the literature exists, especially in studies regarding poorer countries or low-income countries, which often do not have enough high-quality data and therefore lack sufficient rigorous

analysis (Rousseau & D'Onofrio, 2013). The reason for this gap is that development policy reform is difficult enough with uncertainty, but it is almost impossible with ignorance. An attempt to fill this gap in the literature requires a more complete view of the relationship between financial development and growth. This may need further research into this relationship at lower levels of per capita income and to identify the context in which finance affects growth. Therefore, in light of the relatively small size of low-income countries' financial systems, investigating how financial development can be triggered in the low-income countries will, as growth ensures, help to distil and refine the lessons from the literature on the finance-growth causal nexus. In this context of study, a clearer picture of the finance-growth relationship for small island countries in the Pacific region will be investigated.

A number of cross-sectional studies have established the positive relationship between financial sector reform and performances of the economic sector. These studies include that of Goldsmith (1969) who compiled data on 35 countries over the period 1860 to 1963 on the value of financial intermediary assets as a share of economic output. The author assumed that the size of the financial intermediary sector is positively correlated with the quality of financial functions provided by the financial sector. However, Goldsmith's work had several weaknesses; it did not systematically control for other factors influencing economic growth, the size of financial intermediaries may not accurately measure the functioning of the financial system and may not identify the direction of causality. Following Goldsmith's work, King and Levine (1993b) studied 77 countries over the period 1960 to 1989, and systematically controlled for other factors affecting long-run growth. The authors looked at capital accumulation and productivity growth channels, constructed additional measures of the level of financial development and analysed whether the level of financial development predicts long-run economic growth. Their findings showed that there is a strong positive relationship between each of the financial development indicators and the three growth indicators (long run real per capita growth rates, capital accumulation and productivity growth) used in the authors' study.

The positive impact of finance on economic growth was highlighted by a number of seminal authors on the finance-growth relationship links. King and Levine (1993b) supported Schumpeter's view on the positive impact of finance on economic growth for an extended period of 1960-1989, using the measures of financial intermediary development and added a new measure of private credit (credits to the private sector) as a percentage of GDP. Their results indicated a strong connection between the exogenous component of financial development and real per capita GDP long-term growth, and the rate of physical capital accumulation. Similar findings were highlighted in the study of Levine et al. (2000) who used the Generalized Method of Moments (GMM) to examine the nature of the effect of financial intermediary development on growth using panel and cross-sectional data of 71 countries. The GMM is specially designed to deal with key problems in past studies investigating the

finance-growth relationship. In addition, in terms of cross-country differences in the legal rights of creditors, the authors' findings support the view that legal and accounting reforms, such as creditors' rights, contract enforcement, and accounting practices can boost financial intermediary development. Despite their results implying that financial development boosts steady-state growth, Aghion et al. (2005) challenged this conclusion by developing a model of technological change that predicts countries with levels of financial development above a critical level, in which the threshold level will converge to growth rates. Aghion et al. found that financial development positively influences the rate of convergence, where financial development exerts positive but diminishing influence on the steady-state levels of real per capita output.

These studies extended to findings that permit the identification of the long-term cumulative effects of financial development on economic growth. This finding was highlighted by Xu (2000) who used a VAR approach to investigate 41 countries over the period 1960-1993 and provided strong evidence that financial development is important for economic growth through the investment channel. Similarly, Demetriades and Hussein (1996), and Christopoulos and Tsionas (2004) found strong evidence in favour of the hypothesis that long-run causality runs from financial development to growth, however there is no evidence of bi-directional causality. These sum up the main findings of cross-sectional analysis studies on developed countries, but little has been documented on small island countries in the Pacific region.

Previous studies have also addressed the methodological aspect of studying the financial development and economic growth relationship. Building on the work of Schumpeter (1912), Gurley and Shaw (1955), Goldsmith (1969) and McKinnon (1973) employed different econometric methodologies and data to assess the role of the financial sector in stimulating economic growth. The growing body of empirical research, using different statistical procedures and data sets, produces remarkably consistent results. First, countries with better-developed financial systems tend to grow faster – specifically, those with large privately owned banks that funnel credit to private enterprises and a liquid stock exchange. Here the level of banking development and the stock market both exert a positive influence on growth (Levine, 2003). The financial system matters because it influences the spread between deposit and loan rates and a more efficient financial system can lead to a slight increase in investment, thus growth. King and Levine (1993a) and Levine (2003) have shown that better-functioning of the financial system eases the external financing constraints that impede firm and industrial expansion. Thus, access to external capital is a channel of financial development through which financially constrained firms can expand. This opens up the possibility of studying how the financial system affects long-run growth.

Financial development is associated with productivity growth and capital accumulation, the two channels through which finance may influence economic growth. Beck and Levine (2001) applied the

GMM method to a panel data set for periods 1976-1998 and found that stock markets and banks positively influence economic growth. These findings are not due to potential biases induced by simultaneity, omitted variables or unobserved country-specific effects. This highlighted the assumption that across different estimation procedures and different control variables, both stock market and bank development independently impact economic growth. This forms the basis that helps policymakers set reform priorities and influence debates on the comparative importance of different segments of the financial sector (Demirguc-Kunt & Levine, 2001). Evidence from other studies such as Guiso, Sapienza, and Zingales (2002) finds that local financial development enhances the probability that an individual who starts his/her own business, increases competition and promotes the growth of firms.

Further studies also focus specifically on the measurements of financial development indicators in econometric models. Levine and Zervos (1998) measured banking sector development by using bank credit defined as the bank credit to the private sector as a share of GDP. This measure of banking development excludes credit issued by the government and the central bank. The authors argued that this indicator is able to capture the banking sector allocation of credit to private firms. Recent studies have used instrumental variables to extract the exogenous component of financial development. In using instrumental variables, Levine et al. (2000) also developed a new measure of overall financial development. They used private credit, which equals the value of credits by financial intermediaries to the private sector divided by GDP. The cross-country instrumental variables are used to address both causality issues and the construction of accurate measures of financial development. Alternatively, another approach is using the microeconomic studies of finance and growth by looking at industry and firm-level data. Empirical studies may not resolve the issue of causality, which could be due to differences in political systems, legal traditions or institutions that drive both financial development and economic growth rates. Seeking to resolve the causality issues and to document in greater detail the mechanisms through which finance influences economic growth in developing small island states such as Vanuatu shape the main focus of our study.

A growing body of empirical analyses using various measurements of financial development, such as those of Demirguc-Kunt and Maksimovic (2001) whose work covers firm-level and industry-level studies, and others including Xu (2000), Beck and Levine (2001), King and Levine (1993a), Christopoulos and Tsionas (2004) and Aghion et al. (2005) who focus on individual country and broad cross-country studies, all demonstrated a strong positive link between the functioning of the financial system and long-run economic growth. The finance-growth link goes beyond the relationship between finance and shorter-term fluctuations. Undoubtedly, the financial system is shaped by non-financial developments, such as telecommunications, computer, institutions and economic growth which influence the quality of financial services and the structure of the financial system.

Technological improvements and lower transaction costs affect financial arrangements. In specific cases, better-developed financial intermediaries reduce income inequality by disproportionately boosting the incomes of the poor (Beck, Demirguc-Kunt, & Levine, 2004).

2.4 Vanuatu's economic background and factors determining Vanuatu's economic growth

2.4.1 Macroeconomic background

Vanuatu shares similar economic features with 14 other small Pacific Island Countries (PICs). These features include a small manufacturing base and a narrow range of exports of copra and fish. These islands are highly dependent on imports ranging from food and mineral fuels to intermediate and capital goods and transport machinery. They have a narrow range of exports dominated by primary products, such as bananas, copra, fish and timber. Their fixed exchange rate regimes have served them well since most of their imports have been sourced from Australia and New Zealand (Jayaraman & Choong, 2012).

Samoa, Solomon Islands, Tonga and Vanuatu have independent currencies and their own central banks under the fixed exchange rate regimes. Their financial sectors are small and have underdeveloped money and capital markets. Vanuatu is heavily subsistence-oriented, dominated by agriculture and fisheries (Jayaraman & Choong, 2012). Its communally-owned land tenure system (unique to all Pacific Islands) makes it difficult for private sector land based activities to develop in these areas (Jayaraman, 2003).

Vanuatu's economic growth rate since independence has kept pace with the rate of population growth of almost 3 percent per year. In 1995economic growth deteriorated and GDP fell by 2.9 percent. The economy remained stagnant and declined in each of the next two years (Jayaraman, 2003). This was a result of a weak offshore financial sector. The economic recovery in 2000 was led by construction and improved tourism against a backdrop of weakened tourism in the neighbouring country of Fiji, as a result of political instability. Economic growth was stifled by a still fragile tourism sector and a narrow range of primary product exports (copra, beef, cocoa, coffee and kava) that were susceptible to external and supply shocks through vulnerability to natural disasters.

From 1997, the government of Vanuatu implemented a three year Comprehensive Reform Program (CRP) with support from the Asian Development Bank and bilateral donors (Pacheco 2007). The program encompassed governance, fiscal management, public service reform, reform of public financial institutions, outer island development and mitigation of the social impact of reforms. The reform of the financial sector was central to the private sector development component of the CRP, which focuses more on streamlining and restructuring government-owned financial institutions (ADB

Country Reports, 2001). The program aimed to strengthen public institutions, strengthen the legal sector and extensive financial and economic reform to improve the performance of the economy and raise the standard of living. Despite such efforts, the success of this program was a challenge to achieve, as it was difficult to implement development strategies in a short period of time and this was accompanied by political instability in the country (Nari, 2000). Economic growth was supported by tourism, a major driver, followed by the construction activity associated with large donor-funded infrastructure projects and financial sector development that brought an increase in real estate, professional and insurance services activity in the post-2000 period (RBV, 2008). Despite a largely undiversified economy, the economy weathered the global headwinds following the global financial crisis during the period 2005 to 2008. During that period, Vanuatu's GDP expanded at an annual average rate of 6.3 percent which further slowed down during the period 2009-2010. This occurred apart from Vanuatu's resilience, owing to the relative isolation of its financial sector, the strong performance results of Vanuatu's major trading partner, Australia, and the continual support brought by large-value donor-funded infrastructure projects that took the lead in driving construction activity and economic growth during the period leading up to 2013.

2.4.2 Structure of formal financial institutions in Vanuatu

Vanuatu's financial sector comprises the Reserve Bank of Vanuatu (RBV) and four commercial banks. Three of the four commercial banks are foreign banks (ANZ Bank, Westpac Banking Corporation and Bred Bank). The other bank is the government-owned National Bank of Vanuatu (NBV). Foreign banks dominate the banking sector and account for a large (over 70 percent) proportion of the total assets in the financial system (Jayaraman, 2003). The commercial banks play a dominant role in the domestic financial system and the offshore banks have no direct impact on the conduct of monetary policy. Besides these formal monetary-depository institutions, the country also has a government owned national provident fund institution (Vanuatu National Provident Fund), a number of insurance companies and several small financial institutions. Despite reforms such as the Comprehensive Reform Program (CRP), a vast majority of Ni-Vanuatu citizens still face constraints in accessing financial services. Geographic constraints on access to financial services are a challenge faced in allocating financial and banking services in dispersed rural islands. As a result, the urban areas are provided with much better banking facilities than rural areas.

Banking activities are largely confined to urban centres, in which formal sector activities are concentrated. The deepening process of the financial sector, as reflected in the ratios of narrow and broad money, has been slow (Jayaraman & Choong, 2012). As Pacific Island Countries (PICs) lack an active bond and equity markets, there are no other attractive financial instruments other than savings and time deposits for savers to invest in. For Vanuatu, following liberalisation of the economy and development of the financial sectors since the 1990s, the ratio of broad money to GDP has

increased between 50 percent to 60 percent, while Vanuatu's broad money has been close to 200 percent of GDP (RBV, 2012), an indication of the growing economy and the development of the financial system (Jayaraman, 2003; Jayaraman and Choong, 2007).

2.5 Overview of Vanuatu's financial sector structure

The literature on the Pacific region's banking systems is minimal, thus the effectiveness of the banking frameworks is relatively unknown, particularly because these island nations are relatively small. However, over the last 30 years, significant banking reforms following economic development have taken place at a different pace. This provides the platform for this case-study of Vanuatu's banking system.

The World Bank classifies Vanuatu as a lower middle income country, with gross domestic product valued at US$781 million in 2013 (see Table 2.1). In comparison to other neighbouring small island countries, Fiji, Solomon Islands, Samoa and Tonga, Vanuatu ranks in the middle in terms of size area and population. The country covers 12,190 square kilometres, with a population of approximately 250,000 people with the size of its economy over US$800,000 (World-Bank, 2014). In terms of macroeconomic development, Vanuatu performed well alongside its neighbouring island countries (with the exception of Solomon Islands). The country has gained macroeconomic stability through low inflation throughout the period of study against a background of fluctuating economic growth and highly concentrated tourism services exports. In terms of human development, Vanuatu was ranked 131 (2013) by the United Nations Development Program, lower than its neighbouring countries of Fiji, Samoa and Tonga.

Table 2 1 Vanuatu – Major Economic and Social Statistics for the period 2013

Country		Fiji	Solomon Is	Vanuatu	Samoa	Tonga
Area (sq. km)		18,270	28,900	12,190	2,840	750
Population (million)		0.881	0.561	0.252	0.190	0.105
GDP ($US billion)		3.855	1.060	0.802	0.796	0.433
GDP per capita		4,376	1,889	3,172	4,189	4,123
Avg growth rate	1983-1997	2.1	5.8	3.8	1.0	1.8
(GDP)	1998-2013	2.0	2.3	2.8	2.8	1.5
Avg Inflation rate	1983-1997	4.8	9.5	4.2	12.0	7.3
(CPI)	1998-2013	3.5	6.3	3.2	3.4	5.4
HDI Rank (2013)		88	157	131	106	100
Import as % of GDP		78	67	51	50	58
Export as % of GDP		59	56	48	31	22

Source: World Bank, UNDP; HDI – Human Development Index

Table 2.2 shows that the per capita GDP of Vanuatu rose from a level of $1,067 in 1984 to $3,161 in 2013, indicative of Vanuatu's growth and development, despite a slight decline in the period 2002

(ADB, 2002). This places Vanuatu as a lower middle income country of the world, although its Human Development Index ranking seems to be lagging behind four Small Pacific Island Countries.

Table 2 2 Vanuatu – Per Capita GDP for the period 1984 to 2013

Vanuatu	1984	1990	1996	2002	2008	2013
Per Capita GDP	1,067	1,080	1,427	1,354	2,697	3,161
% annual growth rate	20.3	6.8	2.6	-0.6	12.7	0.3

Source: RBV, World Bank

There is a great consensus amongst studies on the finance growth relationship documenting the importance of banking to the economy. Economic activities such as consumption, production, and distribution cannot be carried out effectively without banks. The government cannot effectively use various monetary and fiscal measures without banks for the accomplishment of various socio-economic objectives. Therefore, the literatures have supported the statement made by Knut Wicksell concerning money and credit that the 'bank is the heart and central point of a modern exchange economy' through money creation and expanding purchasing power (Friedman and Kuttner (2010); Ravn (2015)). Capital formation is the basic factor for economic development as a means of creation of physical assets, such as machines and buildings, which increase the productive capacity of a country. For capital formation, savings are required which are largely mobilised by commercial banks. In the same way, bank credit enables entrepreneurs to innovate and invest, and thus promote economic activity (Levine, 2003).

A financial system is a broad network that encompasses all savings and financing opportunities as well as the financial institutions that mobile savings and provide credit (Rousseau & Sylla, 2003). This can be divided into three categories, namely the formal, semi-formal and informal institutions. This current study mainly looks at the formal institutions which include a legal infrastructure that provides an option to lenders and protection to depositors. Vanuatu's formal financial institution is similar to other Island countries in the Pacific (Fiji, Samoa, Tonga and Solomon Islands). The financial institution structure comprises the Reserve Bank of Vanuatu (RBV) and the government owned Vanuatu National Provident Fund (VNPF) Institution with four commercial banks: a government-owned bank (National Bank of Vanuatu), three foreign owned banks (ANZ Bank, Westpac Bank and Bred Bank), a number of insurance companies and several small financial institutions.

Table 2.3 shows the mean and standard deviations of financial intermediation indicators for the period 1983 to 2013. It can be seen that Vanuatu has a reasonably high level of financial intermediation. Interest spread which represents the cost of financial intermediation in a competitive environment should fall as the level of financial intermediation increases. However, for Vanuatu, the interest rate spread is high (although the standard deviation shows a low variability on

the spread) which may reflect the high market concentration and the low effective competition amongst banks.

Table 2 3 Financial intermediation indicators for the period 1983-2013 for Vanuatu

	Ratio of private sector credit to GDP	Ratio of commercial bank assets to sum of commercial banks' and central bank assets	Interest Rate Spread
Mean	34.7	85.6	9.1
Std. D	23.6	4.5	1.0
Min	10.8	79.4	7.3
Max	87.1	95.9	11.3

Source: Reserve Bank of Vanuatu

Despite the similarities to its neighbours, Vanuatu stands out as a unique country among the Pacific Island Countries (PICs). The specific features of Vanuatu include having no exchange controls of any kind and there are no currency restrictions with its citizens and residents permitted to hold their deposits with commercial banks in foreign currency. There are no direct taxes of any kind on its citizens or expatriates and business enterprises (Jayaraman, 2003). Although Vanuatu's Offshore Financial Centre (OFC) institutions have a tax haven status, they are not allowed to accept local deposits or make loans to residents in Vanuatu. The commercial banks in Vanuatu play a dominant role in the domestic financial system, as most offshore banks are restricted to dealing in domestic currency. As a result, these formal financial intermediaries interact and have a direct impact on the conduct of monetary policy and their development impacts the country's overall economic development (Knapman et al. (2001); Jayaraman (2003)). On the other hand, the activities of semi-financial institutions are often not reflected in the national statistics, and are considered important for Vanuatu owing to their increasing role in the rural areas (specifically those of credit units and VANWODs).

Like most developing countries, Vanuatu relies on a bank-based system developed during the colonial era (pre-1980s). It began with trading houses (Campagnie Caledonienne de Nouvelles Hebrides and the Australian-based Burns Philp Company) that provided banking services for colonial economic interests. After WWII, metropolitan banks such as the Banque de l'Indochine and the Australian-owned Commonwealth Savings Bank began operating in towns where the plantation economy was most widespread (Jayaraman, 2003). From there the British colonial authorities introduced company and banking legislation in 1970 and 1971 to take advantage of the expanding Eurocurrency markets. This resulted in an increase in the number of international banks, trust companies and financial services in the country's Overseas Financial Centres (OFC) (Pacheco, 2007). The private banks not only created a demand for legal and other services but also provided employment and revenues for the colonial administrators. Although the off-shore financial centres grew in the late 1970s, a number of commercial banks set up business in the on-shore market during

the 1980s to 1990s but failed, while others succeeded largely through mergers and acquisitions of already established entities, for example, the ANZ Bank purchase of Barclays Bank in 1985 and the Bank of Hawaii acquisition of Banque Indosuez in 1993 (Jayaraman (2003); Pacheco (2007)). The original banks in Vanuatu were actually the agents of international commercial banks, which set up branch offices in Port Vila on Efate and eventually expanded their operations to Luganville on Santo Island.

Commercial banks as an intermediary in the economy perform the main function of mobilising savings from sectors that have surplus funds and extend them by way of credit to individuals, corporations, financial institutions and others. Commercial banks have a long involvement in the economic development of Vanuatu. According to the IMF, the gradual exit of foreign banking institutions in Vanuatu from the on-shore market is the result of banks seeking to consolidate and reduce the marginal cost of their operations, besides Vanuatu having a small but lucrative market. At the same time private banks that survive the intense competition between them not only benefit from the country's tax free status but are able to realise high profits (Knapman et al. (2001); Jayaraman (2003)). Jayaraman (2003) noted that since the 1990s, private banks do not mobilise deposits for the benefit of the local market with only less than 35 percent of the total deposits transformed into loans and advances to residents. This means that, even though these banks have very good access to financial resources, their role as facilitators of credit for the local market is somewhat narrow and socially exclusive. This is partially related to the high operational costs and risks involved. The UNDP estimates more than two-third of Vanuatu's household incomes in the urban areas come from wages and salaries. Only 23 percent of the household incomes in rural areas come from wages and salaries which is an indication that it is harder for the rural population to have access to loan and credit facilities(VNSO-UNDP, 2010). Onshore private banks are still directing their services to a very small section of the population, which is affordable to a few (see Table 2.4). The high concentration of credit is evident as banks allocate over a third of the credit available in the country to housing and land purchases and consumption activities that only a few can afford.

Table 2 4 An Overview of Vanuatu Credit Allocation to the Private Sector (2005, 2009 and 2013)

Economic Sector	2005		2009		2013	
	Million VT	Share	Million VT	Share	Million VT	Share
Housing & Land Purchases	4,387	23%	12,227	28%	16,894	31%
Personal: others	3,737	20%	5,651	13%	10,506	19%
Construction	2,918	16%	5,183	12%	3,773	7%
Distribution	1,863	10%	3,267	8%	4,717	9%
Tourism	1,707	9%	3,020	7%	4,991	9%
Manufacturing	1,117	6%	2,085	5%	1,724	3%
Professional & Other Services	916	5%	1,969	5%	6,049	11%
Transport	626	3%	3,020	7%	443	1%
Agriculture	304	2%	595	1%	661	1%

Financial Institutions	122	1%	1,762	4%	5	0%
Entertainment & Catering	59	0%	135	0%	695	1%
Public Corporations	47	0%	38	0%	648	1%
Fisheries	27	0%	52	0%	10	0%
Government	9	0%	5	0%	85	0%
Public Utilities	7	0%	36	0%	205	0%
Mining & Quarrying	-	0%	130	0%	45	0%
Miscellaneous	828	4%	3,984	9%	3,136	6%
Total	18,671	100%	43,159	100%	54,586	100%

Source: *Monetary and Banking Statistics – RBV Quarterly Economic Review*. Port Vila, October-December 2005, October-December 2009 and October-December 2013

The access to financial resources is further constrained by Vanuatu's limited geographic spread of private bank branch offices. Apart from their head offices in the capital city, private banks have only one branch office each in Vanuatu's second largest town, Luganville (Knapman et al., 2001). In contrast, the government-owned bank, National Bank of Vanuatu (NBV) has a network of 19 rural branches on 12 major islands (Maurer, 2002). The weak local community development by foreign banks is a post-independence phenomenon and the result of political and economic changes in Vanuatu. Private bank credit played a prominent role in contributing to Port Vila's infrastructure and other long term development projects. However after independence, such projects were overshadowed by official aid from regional donors and multilateral financial institutions which included the Asian Development Bank. Up to 1998, the Vanuatu Development Bank undertook this task and provided loans for small businesses and long term loans for large development projects in both rural and urban areas. The beneficiaries of small loans were usually people who did not have a long track record of credit acquisition, but had good business prospects or were otherwise considered 'non-bankable' by commercial establishments (Pacheco, 2007).

The progress in financial development had its challenges. The economic shocks of an overvalued exchange rate, a fall in the terms of trade, the sudden onset of recession or high real domestic interest rates, can negatively impact on the profitability of businesses with bank debts (Cecchetti, Mohanty, & Zampolli, 2011). This can affect the quality of a bank's assets and in turn diminish a bank's loan portfolio. In the same way, socio-economic instability such as high inflation or fiscal deficits can shrink the demand for deposits and affect the ability of banks to procure funds for its operations. The financial system also becomes more vulnerable when there is an explosion of credit offerings associated with speculative bubbles (Pacheco, 2007).

Vanuatu experienced declining investment from its Asian trading partners which suffered severe financial downturns in the 1997 Asian Financial Crisis and the 1998 Vanuatu National Provident Fund (VNPF) crisis. This was accompanied by a budget deficit blow-out of 7.2 percent of GDP and attempts

to devalue the Vatu by 20 percent led to a loss of investor confidence and a sharp decline in foreign currency deposits (Jayaraman, 2003). These factors brought to the surface some socio-economic problems faced by the financial institutions. As a result, reform in the financial sector began after the implementation of the Comprehensive Reform Program (CRP) in July 1998, which provided amongst other measures, legislation that improved governance procedures within the government-owned financial institutions. This reform and other transformations resulted in a slow turnaround and signs of recovery by 2002 (Chand (2002); ADB (2002)).

Studying the financial system gives an indication of whether the state is committed to the welfare of most of its citizens. And as a result, banking practices impact directly on people's ability to access banking services and in turn affect their ability to create viable income-generating activities (Pacheco, 2007). According to the ADB, financial intermediation can be weak in an economy with an open capital account and a combination of factors, such as regulatory barriers, insecurity of debt contracts, lack of creditor records that raise the risk premium of lending and high sovereign risks in the form of exchange rate risk (ADB, 2002). More importantly, ADB highlighted that the long-term solution to access to credit could be supported by direct state intervention (such as the establishing of the Vanuatu Development Bank), and paying more attention on the cause of limited access to credit. This supports the various reasons that the development of the financial system is of interest to past researchers and seminal authors in finance.

Financial reforms can be classified through the monetarist principles that view liquidity or the ability to convert assets into cash as the prime factor affecting the economic conditions in the country (Pacheco, 2007; Sahay et al., 2015). McKinnon (1973) developed the concept of financial 'repression' to describe the way the states interfere with financial freedom. Shaw (1973) on the other hand developed the concept of financial 'deepening', which suggests that the most efficient financial systems are those that achieve low transaction costs whilst providing an optimal risk/reward profile for firms and individuals (Pacheco, 2007). It is important that state-led efforts to create legal and economic environments that make up the expansion of the financial markets should be seen as a positive force. In the early establishment of Vanuatu's financial system, this is important for the country because of its Offshore Financial Centre which grew not so much as a result of local entrepreneur activity, but more due to Vanuatu's tax haven.

2.6 Vanuatu's financial development: some facts

In this section, some stylised facts about financial development in Vanuatu, specifically on the financial depth of the country are discussed. The traditional indicators of financial depth such as private sector credit to GDP ratio are analysed and compared with other sub-regions in the Pacific and high income OECD countries, and over time. Finally, this section covers an examination of the

correlation between financial development and economic growth in Vanuatu and how the correlation may have changed since the economic reform that took place in 1997.

2.6.1 Comparison of financial depth in selected Pacific Island Countries

Table 2.5 Correlations of Financial Depth with GDP Per Capita

	Vanuatu	Fiji	Samoa	Tonga	Solomon Is
	GDP per capita				
	1982-1997	1982-1997	1982-1997	1982-1997	1990-1997
Liquid liabilities	0.08	0.74	0.32	-0.11	-0.57
Credit to private sector	0.05	0.85	0.32	0.79	-0.74
	1998-2013	1998-2013	1998-2013	1998-2013	1998-2013
Liquid liabilities	-0.46	0.36	0.64	0.59	0.50
Credit to private sector	0.63	0.44	0.91	-0.19	0.26

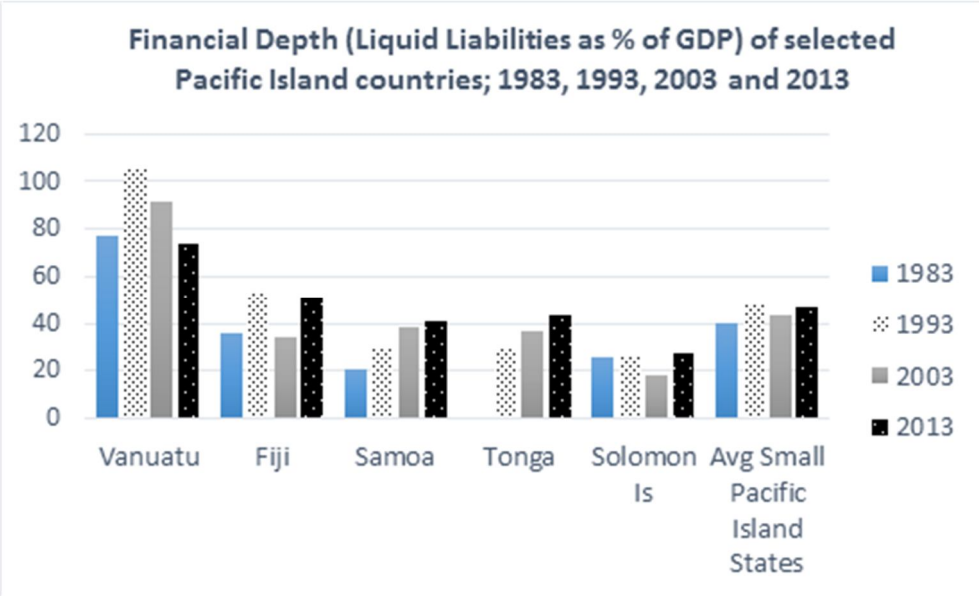
Source: Author's calculation (2015)

Table 2.5 shows that liquid variables have mixed results in each set of periods. Liquid liabilities has a stronger correlation with GDP per capita in the period leading to 2013 than the period leading to 1997 for Samoa, Tonga and Solomon Islands. Samoa and Tonga exhibit positive correlation while Vanuatu exhibits a negative correlation. Fiji has a positive correlation but weakened compared to the period leading to 1997. Solomon Islands has weakened correlation but the signs of correlation change from negative to positive. Credit to private sector has a stronger correlation with GDP per capita in the period leading to 2013 than 1997 for Vanuatu and Samoa and both are positively correlated. Fiji continued to maintained a positive (although slightly weakened) correlation with GDP per capita. Tonga and Solomon Islands not only exhibited a weakened, but also an opposite correlation in 2013 vs. the period leading to 1997. Apart from a negative correlation between liquid liabilities (as a variable of financial development) and income, the growth in credit in the private sector in Vanuatu has a stronger correlation with GDP per capita.

Although the ratio of liquid liabilities to GDP per capita has helped to identify the possible link between financial development and growth for these Pacific island countries, further analysis is likely to identify whether financial development causes growth (or vice versa). The results of the correlations do not address causality issues and the effect of one variable on another. Therefore, estimation of various Ordinary Least Square models helps to identify the direction of causality from one variable to another or the degree of the influence of one variable on another.

Figure 2.2 shows the financial development as a proportion of GDP in Vanuatu is higher than the other four selected small island country states and well above the average of these countries put together. By 1993, Vanuatu's Liquid Liabilities as a percent of GDP rose to 104%, higher than the selected Pacific Island Countries' average.

Figure 2 2 Financial Depth – Vanuatu and Selected Small Pacific Island Countries

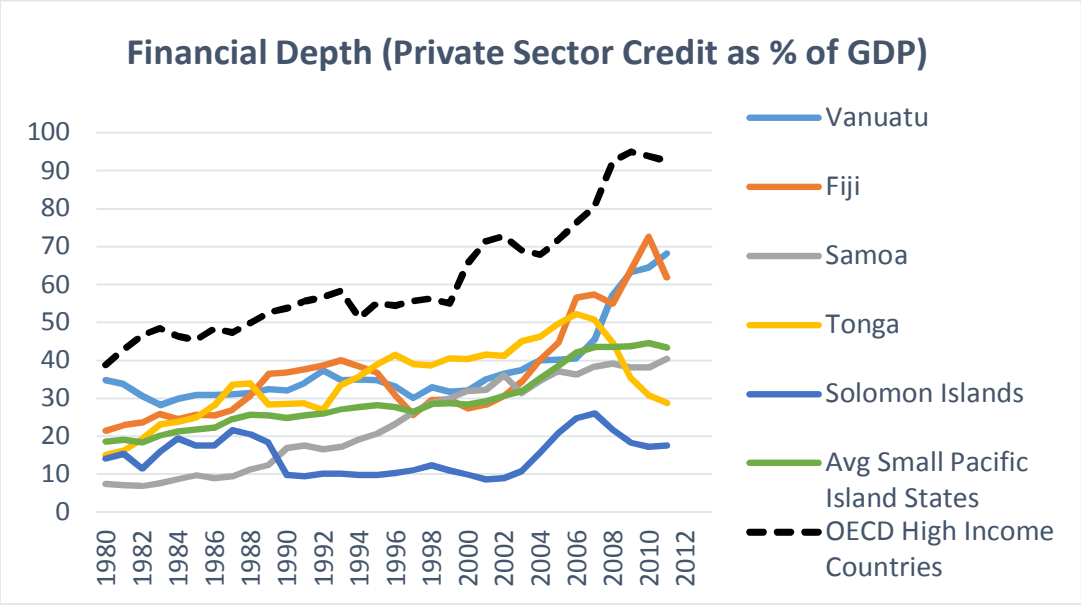


Source: World Bank Global Financial Development Database

The financial depth provides a measure of the size of the financial system relative to the size of the economy (or GDP). As Figures 2.3 and 2.4 show, the expansion of both the private sector credit and total deposit money bank assets indicates that aggregate financial depth in the region has increased since the early 2000. Vanuatu and Fiji lead above the average trend of the selected Pacific Island Countries and are weakened after the 1997-1998 Asian Financial Crisis. Financial depth measured by bank credit to the private sector doubled in 2010 as a percentage of GDP compared to their levels over a decade ago. Apart from Solomon Islands and Tonga which noted declines in bank credit after 2008, the other three countries maintained high levels of bank credit, specifically led by Vanuatu and Fiji. Likewise, the total deposit money bank assets as percent of GDP also a showed similar trend. For Vanuatu, the banking sector has been important in the deepening of the financial sector following the introduction of a new commercial bank (Bred Bank) in 2008. Aside from Fiji which has a capital market, the financial sectors in the selected small Pacific Island Countries are dominated by the banking sector.

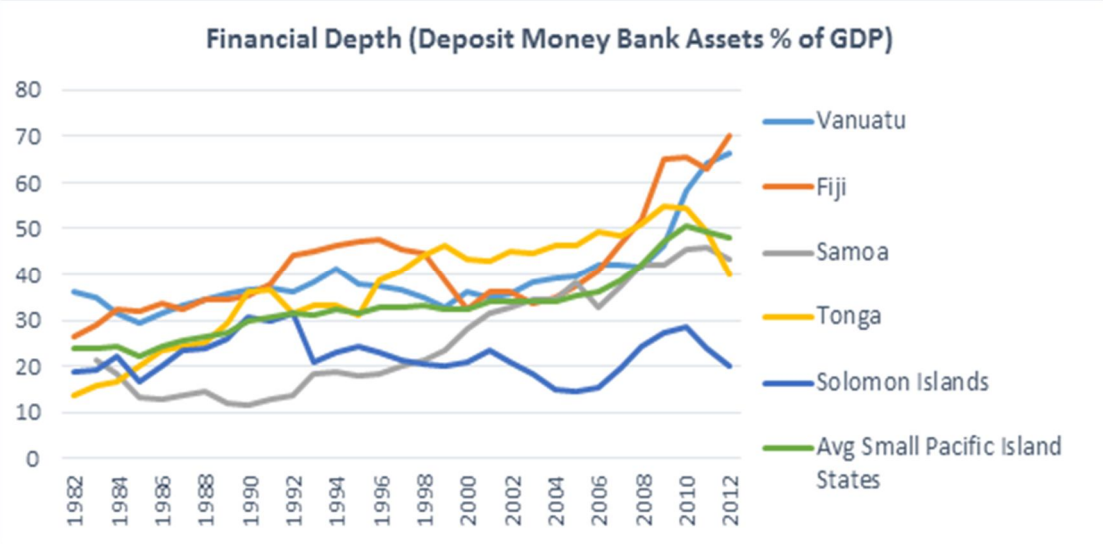
When making comparisons with the average level for high income countries, the level of financial depth measured by bank credit to the private sector as a percentage of GDP is relatively low for Pacific Island countries. This supports the perception that the financial systems of these selected Pacific Island Countries has developed at a slow pace over recent years. This implies that the system is financially underdeveloped.

Figure 2 3 Private Sector Credit – Vanuatu and Selected Small Pacific Island Countries



Source: World Bank Global Financial Development Database

Figure 2 4 Deposit Money Bank Assets – Vanuatu and Small Pacific Island Countries



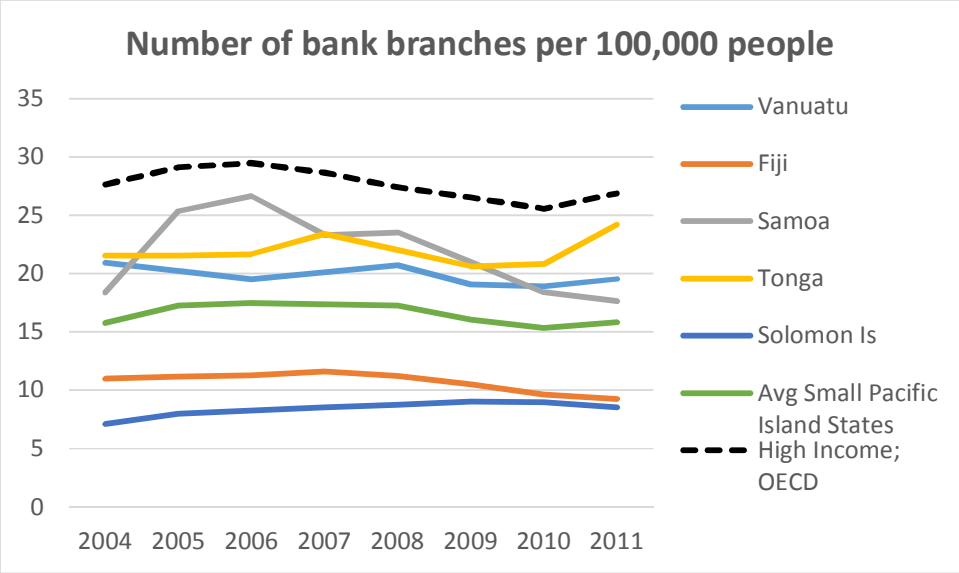
Source: World Bank Global Financial Development Database

2.6.2 Financial depth and access for Vanuatu, selected Pacific Island Countries and high income OECD average

Figures 2.5 and 2.6 show financial access, measured by bank branches and ATMs per 100,000 people, respectively. The data in Figure 2.5 shows that there are fewer than 25 commercial bank branches per 100,000 people for these selected Pacific Island Countries compared to the average of 30 commercial bank branches per 100,000 people for high income (OECD) countries, an indication that financial access in these countries is also more difficult. This implies that selected Pacific Island Countries are financially underdeveloped. Despite this, Tonga, Samoa and Vanuatu have over 20 branches per 100,000 people, higher than the selected group average level, while Fiji and Solomon

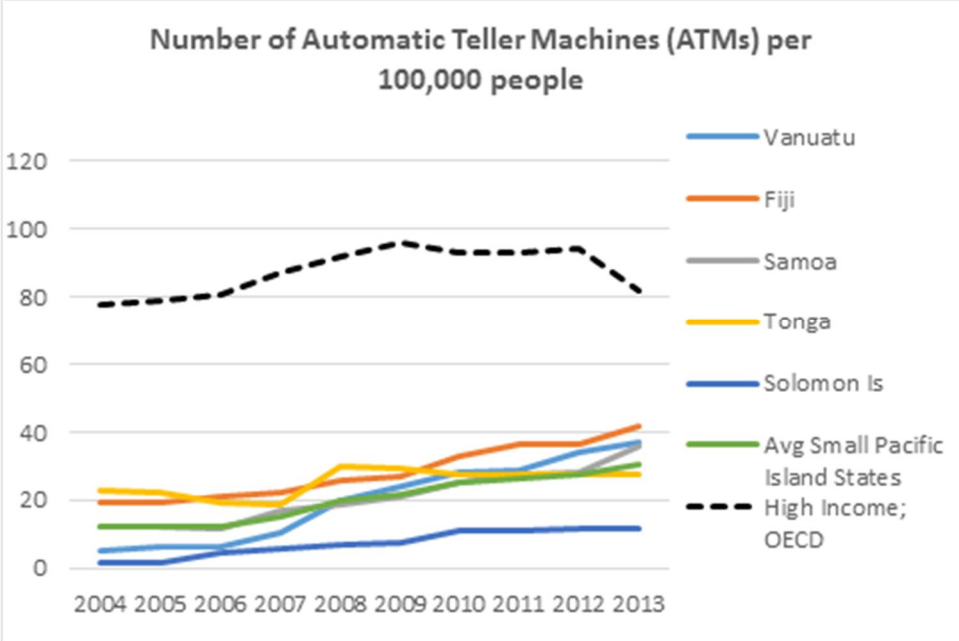
Islands are below the average. Similarly, that the access to financial services, measured by the number of ATMs, is lower compared to high income (OECD) countries also shows the underdeveloped financial sector of these selected Pacific Island Countries (see Figure 2.6). This may reflect the dispersion of bank branches and may mean that it could be more difficult for small enterprises to gain access to financing than larger firms. Therefore, encouraging competition by commercial banks for deposits or using innovation by helping their customers to utilise financial services through the use of the internet may assist in increasing the access to finance.

Figure 25 Number of Bank Branches per 100,000 people



Source: World Bank Global Financial Development Database

Figure 26 Number of Automatic Teller Machines (ATMs) per 100,000 people



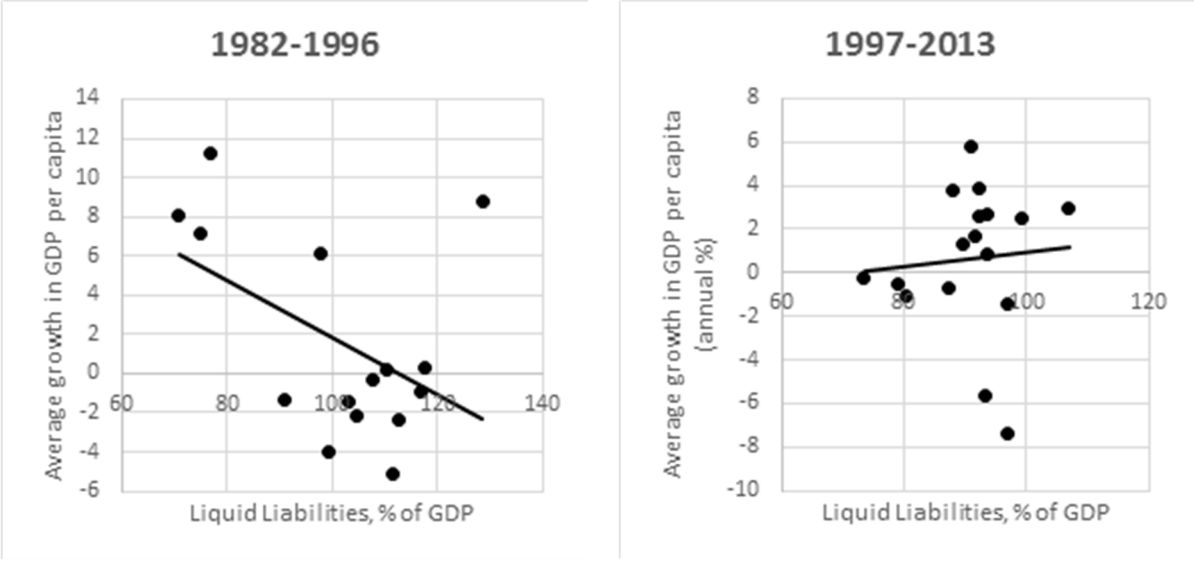
Source: World Bank Global Financial Development Database

2.6.3 Correlation between Vanuatu's financial development and growth

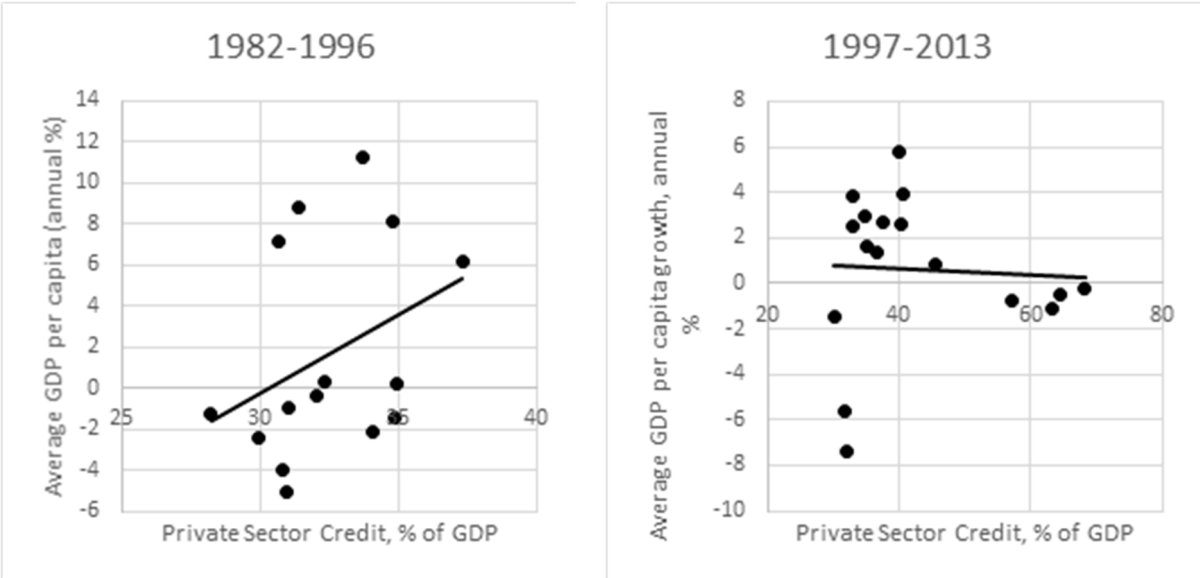
The section empirically examines the central focus of this current study, the relationship between financial development and economic growth. As previously discussed, economic theory suggests that more robust and efficient financial systems will have a positive effect on growth, and hence a positive relationship between the two variables. Figure 2.7a and Figure 2.7b show mixed views of the trend in the financial development-growth relationship in the early 1980s to 1990s, with liquid liabilities showing a negative relationship and private sector credit showing a positive relationship with growth. However, the relationships improved and became positive, but remained weak through the late 1990s to 2013 (for both indicators of financial development).

Figure 27 Growth and Financial Development, Vanuatu

a. Liquid liabilities



b. Private Sector Credit



Source: Author's calculations (2015)

Table 2.6 shows the correlations between growth and the two measures of financial development: liquid liabilities and private credit, as a percentage of GDP. Liquid liabilities exhibited a negative relationship with growth in the 1990s, however, they became positive (rather weak) in the period leading up to 2013. On the other hand, private credit exhibited a positive correlation with growth in the 1990s, but maintained a negative and weak correlation in the period leading up to 2013. The negative relationship does not necessarily indicate that the contribution of financial development to economic growth has weakened. The most likely explanation for the weak correlation may be partially associated with the increased risk management practised by banks after the 1997 Asian crisis, and the policy reform implemented by the introduction of the Comprehensive Reform Program (CRP) in 1997.

Table 2 6 Correlations of Financial Development and Economic Growth (GDP Per Capita), Vanuatu

	Liquid Liabilities	Private Sector Credit
1982-1996	-0.47	0.35
1997-2013	0.08	-0.05

Source: Author's calculations (2015)

This brief overview of Vanuatu's financial development compared with other selected small Pacific Island Countries and high income (OECD) countries has confirmed some of the perceptions about financial development in the region. The region remains financially underdeveloped relative to high income countries; however, some marked progress contributed to some improvement relative mainly to banks. Although the access to financial services is not covered in-depth in this current study, initial indicators shows that for these Pacific Island Countries, their financial development lags behind high income countries. The selected small Pacific Island Countries including Vanuatu have experienced substantial financial deepening, mainly driven by the expansion of the banking sector as measured by the number of branches and ATMs per 100,000 people. Since 1997, bank credit in Vanuatu has remained subdued, following the impact of the Asian crisis, and also the increase in risk management by banks following the implementation of the Comprehensive Reform Program.

Chapter 3

Research Methodology

This chapter describes the data and econometric methodology used to investigate the relationship between financial development and economic growth. Section 3.1 presents the research design and Section 3.2 discusses the methodology used to test the hypotheses. Section 3.3 identifies the contribution of major financial sector development reforms on productivity growth, productive sectors and investment.

This methodology closely follows an individual country case-study regression approach used in literatures on finance and growth, using time series data and estimation techniques. Various literatures have identified the characteristics of small developing Pacific Island Countries. These include their smallness, remoteness and isolation causing challenges in trade, their low resource and export base, low capital intensity and low technology capacity contributing to their low economies-of-scale (Winters & Martin, 2004). Despite the progress in financial development, Vanuatu's economic growth is also influenced by other factors including the large dependence on overseas aid and the less resilience to natural disasters that influence growth. This is because small developing countries are faced with diverse political, legal, economic and social structures that contribute to their diverse phases in economic development. These diversities among different developing economies support a country-specific case-study approach to identify the impact of financial development on growth.

3.1 Research Design

Time series analysis is used in our study to investigate the impact of financial development on economic growth. It covers and examines the three research questions (see Chapter 1). The first set of regression analysis investigates whether formal financial development (represented by commercial banking development indicators) contributes to economic growth in small Pacific Island Countries, using Vanuatu as a case-study. Despite the progress in financial development, Vanuatu's economic growth is also influenced by other factors including large dependence on overseas aid and less resilience to natural disasters that impact economic growth. Control variables are introduced in the model to account for other factors that influence economic growth. The model estimation includes unit root tests, tests for causality and non-stationary characteristics, and investigating the short-run and long-run relationship using a Vector-Error-Correction Model (VCEM). Time-series data for the period 1983 to 2013 are used to examine the relationship between the financial development and growth variables.

Further, an Ordinary Least Square (OLS) regression model is estimated with time series data for the period 1983 - 2013 to identify the contribution of financial development, pre and post-Comprehensive Reform Program (CRP), a major financial reform implemented in Vanuatu in 1997. Besides investigating the relationship between financial development and growth, this analysis also determines the impact of finance on productivity growth by major economic sectors and capital accumulation in Vanuatu. Finally, an empirical investigation of Vanuatu's financial sector on growth will be conducted to help identify the problems and challenges small Pacific Island Countries face in developing financial systems and their implications for future growth. It also supports the in-depth analysis of Vanuatu's financial sector structure carried out in the previous chapter and explores the rate of financial deepening, the size and efficiency of Vanuatu's banking system, and the allocation of credit to the private sector with respect to economic development.

Overall, the research is designed to investigate the impact of selected indicators representative of financial development on Vanuatu's economic growth. In doing so, we aim to identify the relationship and the supporting role of financial development on Vanuatu's economic growth. Therefore, we hypothesise that a positive relationship exists between financial sector development through commercial banking development and economic growth, and test the causality (including short-run and long-run) relationship from financial development to economic growth. Secondly, we aim to identify the major sectors receiving the highest level of private sector credit from commercial banks and their contribution to economic growth and hypothesise that financial development influences different channels and sectors following an economic reform. This will support the hypothesis that existing financial sector development initiatives have a positive impact on Vanuatu's major economic sectors.

3.1.1 Investigating the relationship between Vanuatu's financial sector development and economic growth

To investigate the role of finance in the economy, the relationship between Vanuatu's formal financial sector development and economic growth is identified using the theoretical framework established by Schumpeter (1912) who identified how bank loans are essential for economic development. This framework focuses on the role played by entrepreneurs who use stocks of capital supplied through the mechanisms of credit capitalists and banks to support economic development. Banks act as intermediaries between savers and persons who are able and willing to borrow money. Financial intermediaries may boost the rate of technological innovation by identifying those entrepreneurs with the best chances of successfully initiating new goods and production processes (King and Levine (1993a); Galetovic (1996)). Aghion et al. (2005) developed a model on how the ability of firms to access credit during the production process influences innovation and long-run growth when the firms face macroeconomic shocks (e.g. recession). Their findings provided evidence

in line with the theory that macroeconomic volatility exerts a particularly negative impact on innovation and growth in under-developed financial systems because the firms' willingness to undertake research and development (R&D) depends on their ability to borrow in the future to meet adjustment costs. Their ability to borrow is influenced negatively by the likelihood of experiencing a recession and positively by the level of financial development. King and Levine (1993a) have identified various measures of the level of financial development, which is strongly associated with present and future rates of growth, the real GDP per capita growth and the rate of physical capital accumulation. These empirical studies have identified how financial sector development plays an important role in the economic growth and development of developed and developing countries.

Finance through the banking system plays a crucial role in the process of growth. It does this through a variety of mechanisms, such as reducing the cost of capital to firms, allocating capital more efficiently to entrepreneurs, and encouraging greater competition among non-financial firms (Khan & Senhadji, 2000). This current study focuses on the mechanism of credit allocation through bank credit to the private sector and how the allocation decisions foster productivity growth. Khan and Senhadji noted that for small developing countries, the commercial sector becomes an important sector in lending where there is sufficient credit and security, and the capital is invested for a short term (usually for less than a year). Through this process, credit may be allocated to major sectors that support growth. Therefore, a study on Vanuatu's economy and financial system is important from the standpoint of assessing the strengths and weaknesses of ongoing financial development and its impact on economic growth.

Apart from the credit channel highlighting the role of the banking system in supporting economic growth, the financial sector can also be developed in many different ways. McKinnon (1973) and Shaw (1973) highlighted in their studies that free entry and competition in the financial markets increase interest rates on deposits leading to higher saving rates and in turn, increase the amount of resources available for investment. The improvement in efficiency and competitiveness of the banking sector may channel growth in the following ways:

- The range of financial services that are available may increase;
- The diversity of institutions which operate in the financial sector may increase;
- The amount of money that is intermediated through the financial sector may also increase;
- The extent to which capital is allocated by private sector financial institutions to private sector enterprises;
- The improvement in the regulation and stability of the financial sector; and

- The improvement in access to financial services (World Bank, 2001; ADB, 2015).

This current study specifically focuses on the financial development aspects concerning the amount of money that is intermediated through the financial sector, and the extent to which capital or credit is allocated by banks or financial institutions to the private sector.

The role of financial markets, including banking development, in the economic growth process is one critical factor receiving considerable attention and interest more recently in developed and developing countries. The positive link between financial depth (defined broadly as the level of development of financial markets) and economic growth is evident in developed countries with more developed financial markets (Levine, 2005). Demetriades and Hussein (1996) also found evidence of reverse causality where higher growth in developed economies contributes to financial sector development with supporting evidence that the financial system performs the most important role in facilitating the allocation of resources over space and time. Financial intermediaries like the banking system also become essentially important because of the imperfections or frictions which makes economic exchanges costly or not occurring at all. Therefore, financial intermediaries make these exchanges affordable, offsetting the underlying market imperfections and frictions. However, there remains limited theoretical and empirical work in small developing countries supporting this conceptual role of financial markets in economic development. These small developing countries are faced with diverse political, legal, economic and social structures that contribute to their diverse phase in economic development and justify the need for a country-specific case-study approach to identify the impact of financial development on growth.

The standard Solow growth model is a dynamic model of the economy, which describes how the economy changes and grows over time as saving and investment, labour force growth and progress in and advancing technology raise the economy's level of output per worker. The Solow growth model investigates the division of output between consumption and investment and mainly focuses on policies that support long-run growth that increases the efficiency of the labour force. More importantly, apart from the importance of technological progress to sustained economic growth, knowledge and technology can only be developed in interaction with physical capital. Savings and investment are the drivers leading to increases in capital intensity. The developing countries differ from the developed countries due to their low capital intensity (ratio of capital per unit of output) as these countries have relatively little in the way of physical capital (MHHE, 2005).

The Solow Growth Theory identifies two specific channels through which the financial sector may affect long-run growth: capital accumulation and technological progress (Theil, 2001). The more efficient the transformation of savings into investment, the lower the loss of resources and the more the savings can be used for productive investments (FitzGerald, 2006). Alternatively, Montiel (2003)

identifies three ways through which finance affects growth by: (a) creating incentives for accumulation of physical and human capital, (b) allocating capital to the most productive activities, and (c) decreasing the amount of resources used in the process of intermediation. The effects of these channels are supported by the five basic functions of financial intermediaries identified as producing information *ex ante* about possible investments and allocating capital, exerting corporate governance, facilitating risk management, pooling savings and easing exchange (Levine, 1997). Each of these financial functions may influence savings and investment decisions and hence economic growth. Greenwood and Jovanovic (1990) also modelled the dynamic interactions between finance and growth, where growth means that more individuals can afford to join financial intermediaries, thus improving the ability of financial intermediaries to produce better information with positive ramifications for growth.

Extensive empirical work has been done on the relationship between financial development and growth, such as that by King and Levine (1993a) and others (Roubini and Sala-i-Martin, 1992; Gertler and Rose, 1994) who found a strong positive link between financial development and growth, and financial development has predictive power for future growth. They interpret this finding as evidence of a causal relationship that runs from financial development to growth. Evidence on the financial development-growth link is also found in country case studies. McKinnon (1973) studied the relationship between the financial system and economic development in a number of developed countries such as Argentina, Germany and Korea in the post-World War II period and concluded that better functioning financial systems support faster growth. Empirical evidence from studies by Levine (1997) and Demetriades and Hussein (1996) shows that the relationship between financial development and growth reflects reverse causality, where faster growth leads to financial deepening. The real issue documented in empirical literature is not spurious correlations, but one of simultaneity bias. This is tested using a formal causality test to find evidence of a bi-directional causation relationship between financial development and growth. This current study considers these formal causality tests to investigate the relationship between Vanuatu's financial development and economic growth.

The positive relationship between financial depth and growth was also found in empirical studies by King and Levine (1993; 1993a), Levine (1998) and De Gregoria and Guidotti (1995). With their contribution, studies carried out by Rousseau and Wachtel (2007) and Loayza and Ranciere (2005) supported the individual country case-study approach to investigate the short-run and long-run impacts of the finance-growth relationship. Abubakar and Gani (2013) carried out a case-study of Nigeria using the model on the growth of real GDP to gross fixed capital formation, trade openness and interest rate spread as control variables to control for the possible effects of other growth determining factors.

To identify the impact of financial development on Vanuatu's economic growth, a growth model that captures the growth factors in small developing Pacific Island Countries is relevant. In this case, specific relevance and inclusion of the variable components of overseas aid and climatic condition are important control factors affecting growth. These variables distinguish our model specification from other growth models previously studied. Our growth equation includes financial development variables and control variables associated with macroeconomic stability, trade openness, monetary policy, capital accumulation/investment, foreign aid and climatic condition. To investigate the relationship between Vanuatu's formal financial sector development and economic growth, the basic equation adopted from King and Levine (1993b) is tested. It has the following form:

$$G_{j,t} = \beta_0 + \beta_1 FD_{i,t} + \beta_2 X_t + e_t \qquad (3.2.1)$$

Where $G_{j,t}$ represents the value of the j[th] growth indicator (real GDP and per capita real GDP) over the period 1983 – 2013; $FD_{i,t}$ represents the value of the i[th] indicator of financial development (credit to the private sector, total financial assets, ratio of liquid liabilities to GDP and interest rate spread) over the period 1983 -2013; X_t represents a matrix of control variables to control for other factors associated with economic growth (e.g. macroeconomic stability, trade openness, capital accumulation/investment, overseas aid, education, health and monetary policy as a set of control variables, climatic conditions), and e_t is the error term.

Several indicators of commercial banking or financial development have been proposed in the literature. Different indicators indicate different aspects of the financial system representing financial intermediation that signifies the ability of the financial system to channel funds from savers to borrowers (refer to Appendix A). Studies of developed countries such as those of Benhabib and Spielgel (2000), Calderon and Liu (2003), Berthelemy and Varoudakis (1996) and Bordo and Rousseau (2006) have initially used monetary aggregates (M1 as narrow money and M2 as broad money) as indicators of financial development. However, the authors acknowledge that such variables should be used with caution since economies with underdeveloped financial systems such as Vanuatu may have a high ratio of money (M1 or M2) to GDP, as money is used as a store of value in the absence of other more attractive alternatives investment options such as treasury bills. This current study uses a broader defined monetary measure, M3, generally referred to as liquid liabilities of the banking system, used in previous studies such as those of Demetriades and Hussein (1996)), Levine et al. (2000), Beck et al. (2000), Deidda and Fattouh (2002), Dowson (2003), Rioja and Valev (2004), and Abubakar and Gani (2013) as a measure of financial deepening. Credit to the private sector as a partial indicator of financial development has been favoured by a number of studies (such as King and Levine, 1993a; De Gregorio and Guidotti, 1995; Levine et al., 2000; Rioja and Valev, 2004;

Demetriades and Law, 2006) as an appropriate measure of financial intermediaries since it measures more accurately the role of financial intermediaries in channelling funds to the private sector. This justifies why private sector credit would be an appropriate indicator to identify financial deepening or development, particularly in developing countries (such as Vanuatu) where the stock and bond markets are not well-developed. Therefore, the security and stock markets are not important, and their role is ignored in our study but they may become important as Vanuatu's financial system develops in the long-term.

3.2 Investigating the finance-growth relationship

3.2.1 Empirical Model

The time series regression analysis includes variables of growth as dependent variables; a set of independent variables of financial development; and a set of variables to control for growth in GDP. The estimated equation simplified from equation (3.2.1) has the following form:

$$\begin{aligned}\log(RGDP_t) = {} & \beta_0 + \beta_1 \log(FD_t) + \beta_2 \log(GFCF_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(CPI_t) \\ & + \beta_5 \log(ODA_t) + \beta_6 \log(GOVCON_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) \\ & + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t\end{aligned} \tag{3.2.2a}$$

Where $\log(RGDP_t)$ as the dependent variable is the log of the growth indicator identified as log real GDP (interchangeably use $\log(RGDPPC_t)$ identified as real GDP per capita); FD_t is the financial development indicator (represented by $LPSC_t$ as the ratio of private sector credit to GDP, $LM3_t$ as the ratio of liquid liabilities to GDP, $LTFA_t$ as the ratio of total financial assets of the banking system to GDP and $INSP_t$ as interest rate); $\log(GFCF_t)$ is gross fixed capital formation as a share of GDP; $\log(EXPIM_t)$ is total export and imports as a share of GDP; $\log(CPI_t)$ is CPI (inflation); $\log(ODA_t)$ is the net of overseas development aid as a share of GDP; $\log(GOVCON_t)$ is government expenditure as a share of GDP; $\log(HEAL_t)$ is the number of years of life expectancy at birth; $\log(EDUC_t)$ the gross percentage of secondary enrolment; PC_t represents a set of dummy variables: where PC1 (equals 1 with a cyclone in the year or 0 is otherwise), PC2 (equals 1 with two cyclones in the year or 0 is otherwise), PC3 (equals 1 with three cyclones in the year or 0 otherwise), PC4 (equals 1 with four cyclones in the year or 0 otherwise), and e_t is the error term. All variables are in their log forms except interest rate spread and the dummy variable of occurrence of cyclone (Refer to Appendix A for variable description).

Using similar independent variables, and $\log(RGDPPC_t)$ as the dependent growth variable, model 2 simplified from Equation (3.2.2) is as follows:

$$\log(RGDPPC_t) = \beta_0 + \beta_1 \log(FD_{t)} + \beta_2 \log(GFCF_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(CPI_t) + \beta_5 \log(ODA_t) + \beta_6 \log(GOVCON_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t \quad (3.2.2b)$$

To investigate the impact of each financial development indicator on growth, each model is run separately using each of the financial development indicators: private sector credit, liquid liabilities, total financial assets and interest rates as independent variables on the growth variables (real GDP – in Model 1 and real GDP per capita – in Model 2). A definition of the equation variables is given in Appendix A.

3.2.2 Data

A dataset of indicators of financial development focuses on the commercial banking sector in Vanuatu (See Appendix A). The choice of the commercial banking sector is chosen for this study for several reasons: Vanuatu has an under-developed security market, no stock market and the total assets of commercial banks in Vanuatu account for the largest share of the total assets of the financial system. The annual time series data of Vanuatu include real Gross Domestic Product (GDP) and financial development indicators from the period 1983-2013. Major data sources include Annual Reports and Quarterly Economic Reviews of the Central Bank (Reserve Bank of Vanuatu), Statistical Bulletins and National Account publications published by the Vanuatu National Statistics Office.

Financial development is measured by four indicators indicative of the banking sector: **size** (total financial assets as a share of GDP, as TFA); **credit allocation** (the ratio of credit to the private sector as a share of GDP, as PSC); financial **depth** (the proxy of liquid liability of the banking system as a share of GDP, as M3); and **efficiency** of the banking system (the interest rate spread of banks, as INSP). The set of control variables includes gross fixed capital formation as a ratio of GDP measuring capital accumulation or investment; ratio of total exports plus imports as a share of GDP measuring trade openness; inflation measured by CPI as a macroeconomic indicator; net overseas aid inflow as a share of GDP (as a Least Developing Country, Vanuatu continues to receive development aid from its bilateral and development partners); gross rate of secondary school enrolment as a proxy indicator of education; total years of life expectancy at birth as a proxy indicator of health; and finally a dummy variable to include the occurrence of cyclones per year (one 1 if there is cyclone and 0 otherwise). A number of these indicators have short time-series, so extended time-series are obtained from other sources, specifically net aid into the country. Data on education and health are obtained from the World Bank database on the World Bank website and data of cyclone occurrences are obtained from the Vanuatu National Disaster and Meteorological Office (NDMO). These time series are translated into their logs, with the exception of interest rate spread since it is measured as a rate.

3.2.3 Stationarity and Unit Root Tests

Based on equation (3.2.2), a stationary test is conducted on the time series to avoid spurious regressions. A stationary time series is one whose statistical properties such as the mean, variance, autocorrelation, etc. are constant over time in order to obtain meaningful statistics. Thus, it is important that the unit root and stationary tests are carried out to identify the stationarity status of the variables (i.e. I(0) or I(1) in order to ascertain their order of integration before the cointegration test can be conducted (Asteriou, 2006). Economic theory suggests that there are certain pairs of economic or financial variables that are linked by a long-run economic relationship; the variables that are integrated of the same order may be cointegrated, particularly regression models with I(1) data. Therefore, if two or more I(1) variables are cointegrated, they must obey an equilibrium relationship in the long-run, although they may diverge from that equilibrium in the short run (Asteriou, 2006).

According to Engle and Granger (1987) if the variables are cointegrated, the true equilibrium error process must be I(0); if they are not cointegrated then the equilibrium error must be I(1). The null hypothesis of no cointegration against the alternative of cointegration is tested by performing the unit root tests on the equilibrium error process using both the augmented Dickey-Fuller (ADF) test conducted in level and first differences (for this test, the Phillips and Perron (PP) test is also carried out for verification; both tests are similar and used for verification). The Engle-Granger (EG) procedures include choosing the normalisation and testing whether or not the cointegration residual has a unit root – that is I(1) process; and finally rejection of the null hypothesis at a pre-specified significance level implies that the series are cointegrated.

An ADF test is performed on the residual series (not including a constant nor a time trend) to determine their order of integration, in the following form:

$$\Delta \hat{e}_t = a_1 \hat{e}_{t-1} + \sum_{i=1}^{n} \delta_i \Delta \hat{e}_{t-1} + v_t \tag{3.2.3}$$

If $\hat{e}_t$ is integrated to I(0), then the null hypothesis that the variables are not cointegrated is rejected.

This is the first step of the Johansen cointegration procedure which involves testing each variable to determine its order of integration (Asteriou, 2006). Three cases may lead to the next step: first if the variables are stationary I(0) then it is not necessary to proceed further (apply the classical regression analysis); second if the variables are integrated of a different order, it is possible to conclude that they are not cointegrated; and lastly if the variables are integrated of the same order then the next step can be followed.

3.2.4 Johansen Cointegration Procedure

Cointegration analysis was introduced by Engle and Granger (1987) and is a modelling process that incorporates non-stationarity with both long-term relationships and short-term dynamics. We use Johansen's method to test the hypothesis on the cointegrating relationships themselves. The test allows for more than one cointegrating vector since the method can examine more than two test variables. If the first step indicates that all variables are integrated of the same order [I(1)], the long-run (possible cointegration) relationship is estimated (Asteriou, 2006). Cointegration tests such as Engle and Granger (1987), Johansen (1988), Johansen and Juselius (1990), Pesaran et al. (2001), etc. are used to ascertain the presence of a potential long run equilibrium relationship between two variables. The lag length is determined using the Akaike information criterion (AIC) and Schwartz Bayesian criterion (SBC), as well as the diagnostic checks on autocorrelation, heteroskedasticity, and normality effects of the residuals. In general, the model which minimises AIC and SBC is selected as the one with the optimal lag length and which passes all the diagnostic checks. Once the appropriate model (using the Pantula principle) is determined, the Johansen and Juselius (1990)'s procedure based on the propositions about the eigenvalues and trace statistics is used.

The Johansen process is a maximum likelihood method that determines the number of cointegration vectors in a vector error correction model (VECM). The Johansen's estimation model is given as follows:

$$\Delta X_t = \mu + \sum_{j=1}^{p} \gamma \, \Delta X_{t-i} + \alpha \beta X_{t-1} + \varepsilon_t \tag{3.2.4}$$

Where X_t is the vector of all the non-stationary variables used in the study, γ is the matrix of coefficients, $\alpha$the matrix of error correction coefficients where r is the number of cointegration relationships in the variables, so that 0 < r < n. This measures the speed at which the variables adjust to their equilibrium (also known as the adjustment parameter), $\beta$is the matrix of r cointegration vectors, so that 0 < r < n. It represents the long-run cointegration relationship between the variables.

3.2.5 Vector Error Correction Model (VECM) estimation

After establishing the number of cointegrating vectors, the Error-Correction Model (ECM) is estimated with the given choice of selecting unrestricted VAR if there is no evidence of cointegration and selecting VECM if there is cointegration.

The Error-Correction Model (ECM) (Engle & Granger, 1987) is adopted:

$$\Delta X_{1t} = \mu_1 + \alpha_1 \left[X_{1t-1} - \hat{\beta} X_{2t-1} \right] + \sum_j \gamma_{1j} \, \Delta X_{1t-j} + \sum_j \gamma_{2j} \, \Delta X_{2t-j} + \varepsilon_{1t}$$

(3.2.5)

$$\Delta X_{2t} = \mu_2 + \alpha_2\left[X_{1t-1} - \hat{\beta} X_{2t-1}\right] + \sum_j \gamma_{2j}\, \Delta X_{1t-j} + \sum_j \gamma_{2j}\, \Delta X_{2t-j} + \varepsilon_{1t}$$

(3.2.6)

The ECM links the long-run equilibrium relationship between X_{1t} and X_{2t} implied by cointegration with the short-run dynamic adjustment mechanism that describes how the two series react when they move out of long-run equilibrium. On the other hand, the parameters α_1 and $\alpha_2$are the error-correction and also called the adjustment coefficient. They measure the speed of adjustments of X_{1t} and X_{2t} to the long run equilibrium, respectively. It shows how much of the adjustment to equilibrium takes place in the period, or how much of the equilibrium error is corrected. The ECM not only incorporates the short-run effects but also the long-run effects. Another important advantage is that all the terms in the ECM model are stationary and the standard OLS regression is therefore valid. This is because if X_{1t} and X_{2t} are I(1), then ΔX_{1t} and ΔX_{2t} are I(0). In equations 3.2.5 and 3.2.6, the Vector-Error-Correction-Model representation gives a regression that contains I(0) variables and allows both long-run information and short-run disequilibrium dynamics to be used, an important feature of the VECM.

3.2.6 Testing for Granger non-causality – investigating the short-run and long-run causality links

An important feature about the relationship between financial development and economic growth is the direction of the causality between the two sets of variables. Greenwood and Jovanovic (1990) and Greenwood, Sanchez, and Wang (2010) have shown in their studies that the causality runs both ways. A major implication of testing for Granger non-causality is that if two variables, x and y, are co-integrated, then either X must Granger cause Y or vice-versa.

The Granger causality is estimated by the following VAR model:

$$Y_t = \mu_1 + \sum_{i=1}^{n} \beta_i\, X_{t-i} + \sum_{j=1}^{m} \gamma_j\, Y_{t-j} + e_{1t}$$

(3.2.7)

$$X_t = \mu_2 + \sum_{i=1}^{n} \theta_i\, X_{t-i} + \sum_{j=1}^{m} \delta_j\, Y_{t-j} + e_{2t}$$

(3.2.8)

The following hypothesis is tested:

Null hypothesis: $H_0 : \sum_{i=1}^{n} \beta_i = 0$ is the test that X_t does not cause Y_t, against

Alternative hypothesis: $H_1 : \sum_{i=1}^{n} \beta_i \neq 0$ is the test that X_t does cause Y_t.

In each case, a rejection of the null hypothesis implies there is causality between the variables. In testing for causality, two variables are usually analysed together to test for their interaction. There are four possible results (Asteriou, 2006):

- Unidirectional Granger causality from variable Y_t to variable X_t;
- Unidirectional Granger causality from variable X_t to Y_t;
- Bi-directional causality; and
- No causality

3.3 Identifying the contribution of major financial sector development reforms on productivity growth on productive sectors and investment

The only major financial reform in Vanuatu was the Comprehensive Reform Program funded by the Asian Development Bank (ADB) in 1997, adopted purposely to improve the functional operations of Vanuatu's financial sector and public sector reform that support improvement in the organisation of financial institutions. The reform program was timely and implemented to mitigate the effects of the 1997 Asian Financial Crisis. Consequences of this reform involve new policy implementation relating to the financial sector which includes the structural reform of the Vanuatu National Provident Fund (VNPF) and other new policies, such as central bank policies with regard to the introduction of open market operations and the release of the first load of Reserve Bank of Vanuatu (RBV) Notes by the Central Bank. Following these reforms, the expected impacts primarily focused on the financial sector development that may have spill over effects on the real sector and economic growth. As a result, the impact of these reforms which can be seen through the impact of the financial development indicators (selected) on economic growth is investigated.

To investigate the contribution of Vanuatu's formal financial sector development on the overall economy (growth and development), the annualized (time series) data are sourced from the Annual Reports, Quarterly Economic Review reports of the Central Bank (Reserve Bank of Vanuatu) and statistics bulletin and National Account publications of the Vanuatu National Statistics Office.

We use equation 3.2.2 based on King and Levine's (1993b) study to investigate the impact of banking sector development on major economic sectors of the Vanuatu through two main channels. The first through the productivity channel measures the impact of financial development on overall growth (real GDP and per capita growth as the dependent variables). The second is through the capital accumulation/investment channel, where the impact of financial development on capital accumulation represented by gross fixed capital formation (GFCF) as the dependent variable is investigated. Finally, the impact of financial development on growth in major sectors of the economy

(the agriculture, industry and service sectors) as the dependent variables is investigated. To investigate the contribution of the financial reform following the implementation of the Comprehensive Reform Programme (CRP), we examine the pre-reform (period 1983-1996) and post-reform (period 1997-2013) impact on the economy.

Chapter 4

Results

This chapter presents the econometric analysis and the results of the link and causality between financial sector development and economic growth. Section 4.1 describes the summary statistics of Vanuatu's financial development indicators. Section 4.2 presents the results of the econometric model on the impact of financial development on growth; it firstly presents the unit root and stationarity tests followed by Johansen Cointegration procedure results and regression and the Vector Error Correction Model (VECM) results. Section 4.3 presents the results of the econometric model that investigates the contribution of major financial sector development reforms on major economic reform in the major economic sectors of Vanuatu.

4.1 Descriptive Statistics

Table 4 1 Descriptive Statistics of Financial Development Indicators for Vanuatu (1983-2013)

	LPSC	LM3	LTFA	INSP
Mean	34.04	31.07	79.24	8.98
Median	24.50	33.20	77.35	9.20
Maximum	87.10	42.30	130.80	11.30
Minimum	10.80	12.10	22.00	5.10
Std. Dev.	23.56	9.43	31.16	1.19

Source: Author's calculation (2015); LPSC – log Private Sector Credit (as % of GDP); LM3 – log Liquid Liabilities (as % of GDP); LTFA - log Total Financial Assets (% of GDP); INSP – Interest Rate Spread (%)

Table 4.1 shows all financial development indicators show variability throughout the period 1983-2013. The large variation between the minimum and maximum values of financial development indicators (private sector credit, liquid liabilities and total financial assets as a share of GDP) indicate that there is evidence of increased financial intermediation and financial deepening in Vanuatu's economy, and evidently the size of the banking sector has grown over the period of 32 years. However, the large variation between the interest rate gap range may indicate a high borrowing rate over the deposit rate of banks over the study period. This implies that there could be evidence of inefficiency in the banking system (a higher interest rate spread may mean a high borrowing rate which may potentially limit the number of loanable funds into productive sectors and therefore this may imply high bank regulation or banking inefficiencies).

Table 4 2 Correlation Coefficients between the Financial Depth Indicators

	LPSC	LM3	LTFA	INSP
PSC	1.00			
M3	0.71	1.00		
TFA	0.83	0.94	1.00	
INSP	-0.34	-0.03	-0.13	1.00

Source: Author's calculation (2015); LPSC – log Private Sector Credit (as % of GDP); LM3 – log Liquid Liabilities (as % of GDP); LTFA - log Total Financial Assets (% of GDP); INSP – Interest Rate Spread (%)

Private sector credit and liquid liabilities are highly correlated which mean they can cause multicollinearity in the model (see Table 4.2). If both variables are used in the regression model their coefficients may become unstable and difficult to interpret. However, the findings of such high correlation may prove useful since each of these indicators may capture more than one feature of financial development. Depending on the model specification, if there are reasons to drop other financial development indicators, then we can rely on only one of them to provide a complete picture. Interest rate spread has a lower (negative) correlation compared to the other selected financial development indicators, which shows that the variable does not follow the same trend as the other three financial development indicators used in this study. Therefore, we can use any of the other three indicators avoiding problems of serial correlation in the model.

4.2 Impact of financial development on economic growth

4.2.1 Unit Roots and Stationary Tests

The stationary status of the variables is tested to ascertain their order of integration before conducting the cointegration test (see Table 4.3). The following hypotheses are tested:

H0: Variable has a unit root (not stationary)

H1: Variable does not have a unit root (stationary)

Decision: Reject the null hypothesis if the p-value is less than 5% level

Table 4 3 Stationary Tests of All Variables at Levels, First Difference, and Second Difference

	Levels		**First Difference**		
Variables	**ADF Prob****	**PP Prob****	**ADF Prob****	**PP Prob****	**Stationary status**
LGDP	-0.343	-0.401	-4.101*	-4.067*	I(1)
LPSC	0.727	0.685	-4.743*	-4.743*	I(1)
LM3	-2.635	-3.558	-7.897*	-7.794*	I(1)
LTFA	-3.530	-4.737*	-6.430*	-6.430*	Level, I(1)
INSP	-4.542*	-4.485*	-6.753*	-7.346*	Level, I(1)
LGFCF	-2.403	-2.403	-5.283*	-6.607*	I(1)
LEXPIM	-0.691	-0.691	-6.080*	-6.080*	I(1)
INFL	-3.338*	-3.301*	-5.818*	-16.59*	Level, I(1)
LGOVCON	-4.514*	-4.336*	-6.781*	-7.035*	Level, I(1)
LODA	-1.252	-1.124	-5.638*	-5.886*	I(1)
LHEAL	-4.050*	-1.440	0.541	-12.372*	Level, I(1)
LEDUC1	-1.071	-1.071	-5.459*	-5.567*	I(1)
LEDUC	-0.033	-0.040	-5.240*	-5.236*	I(1)
CP1	-6.262*	-6.642*	-10.506*	-16.376*	Level, I(1)
CP2	-4.956*	-4.840*	-6.258*	-13.881*	Level, I(1)
CP3	-2.556	-6.209*	-4.828*	-22.112*	I(1)

CP4	-5.770*	-5.837*	-6.112*	-14.610*	Level, I(1)

Source: Author's calculation (2015); * denotes rejection of the null hypothesis at the 5% level; ** MacKinnon one-sided p-values

The Augmented Dicky-Fuller (ADF) (and the Phillips and Perron (PP) verification) tests for unit root and stationarity on all the variables at levels and first difference (and second difference) show that all five variables are integrated of the same order meaning that at level they are non-stationary, but they become stationary when converted to first difference. All variables have a unit root which implies that they are not stationary at their levels. However, the first difference of the variables has no unit root and the null hypothesis is rejected at the 5% level of significance, indicating that the variables are integrated of the same order, I(1). When the variables are integrated of the same order, we can run the Johansen Test of Cointegration.

4.2.2 Regression Results

Table 44 Johansen Cointegration Procedure Results (Models 1.0.1 – 1.0.5 and 2.0.1 - 2.0.5)

	Johansen Cointegration Procedure for Equations 3.2.2a and 3.2.2b					**Null hypothesis**	**Existence of cointegration**
Model1.0.1	LRGDP	LPSC	LM3	LTFA	INSP	r≤1*	√ r≥1
Model1.0.2	LRGDP	LPSC				r=0	None
Model1.0.3	LRGDP		LM3			r=0	None
Model1.0.4	LRGDP			LTFA		r=0	None
Model1.0.5	LRGDP				INSP	r≤1*	√ r≥1
Model2.0.1	LRGDPPC	LPSC	LM3	LTFA	INSP	r≤2*	√ r≥2
Model2.0.2	LRGDPPC	LPSC				r=0	None
Model2.0.3	LRGDPPC		LM3			r=0	None
Model2.0.4	LRGDPPC			LTFA		r≤2*	√ r≥2
Model2.0.5	LRGDPPC				INSP	r≤2*	√ r≥2

Source: Author's calculation (2015); *denotes rejection of the null hypothesis at the 5% level (see Appendix B for model specification)

The Johansen Procedure results in Table 4.4 show that there is a long-run relationship between real GDP, private sector credit, liquid liabilities, total financial assets and interest rate spread (model 1.0.1) and between real GDP and interest rate spread, despite none for the other variables and real GDP. Similar results are shown for the real GDP per capita and four financial development indicators (model 2.0.1) while a long-run relationship also exists between total financial assets and interest rate and real GDP alone.

Table 4 5Impact of Financial Development on Growth using Real GDP as model 1.0 (and Real GDP per capita in brackets - model 2.0) as the dependent variables (Equations 3.2.2a and 3.2.2b)

	Dependent Variables (Results of Model 2.0.1-2.0.5 LRGDPPC in brackets)				
Independent Variables	**LRGDP (Model 1.0.1)**	**LRGDP (Model 1.0.2)**	**LRGDP (Model 1.0.3)**	**LRGDP (Model 1.0.4)**	**LRGDP (Model 1.0.5)**
C	8.109*** (11.995)***	7.822*** (12.073)***	6.797*** (12.01)***	8.573*** (12.238)***	10.996 (12.447)***

LPSC	0.308***	0.757***			
	(-0.015)	(0.07)**			
LM3	-0.008		0.672***		
	(0.116)		(0.057)**		
LTFA	0.328***			0.473***	
	(-0.0421)			(0.022)**	
INSP	-0.0167				-0.045
	(-0.0091)				(-0.013)*
N	32	32	32	32	32
R-Squared	0.942	0.696	0.819	0.847	0.049
	(0.234)	(0.146)	(0.140)	(0.045)	(0.091)

Source: Author's calculation (2015); LPSC – log Private Sector Credit (as % of GDP); ***, **, *, indicate statistical significance at the 1, 5, and 10 percent levels, respectively; LM3 – log Liquid Liabilities (as % of GDP); LTFA - log Total Financial Assets (% of GDP); INSP – Interest Rate Spread (%); LRGDP – log Real Gross Domestic Product; LRGDPPC- log Real Gross Domestic Product per capita (see Appendix B for model specification)

The regression results for equation 3.2.2a using each of the financial development variables as independent variables show that private sector credit, liquid liabilities and total financial assets have a positive and significant relationship with GDP at the 1% level, respectively (and with GDP per capita at the 5% level, respectively) (see Table 4.5). The models' estimates show that a 1% increase in banking credit to the private sector leads to a 0.8% increase in growth (0.07% increase in GDP per capita growth); a 1% increase in liquid liabilities leads to a 0.7% increase in growth (0.06% increase in GDP per capita growth); and a 1% increase in total financial assets of the banking system leads to a 0.5% increase in growth (or 0.02 percent in GDP per capita growth). Overall, the three financial development indicators exhibit positive and statistically significant relationships with growth. On the other hand, an increase in interest rate spread (possibly driven by a higher borrowing rate) has a negative and significant relationship with GDP per capita growth, at the 10% level. This implies that bank inefficiency leads to a decline in economic growth or vice versa. If interest rate spread declines, bank inefficiencies decline and economic growth is predicted to increase. The model results show a 1% increase in banking inefficiency (represented by an increased interest rate spread) leads to a decline in growth of 0.05 percent (or -0.01 percent in GDP per capita growth). Similar results were obtained when we ran all four financial development variables together with the growth variables. Aside from liquid liabilities showing a negative[2] and insignificant relationship with growth, bank credit to the private sector and total financial assets exhibited a positive and significant relationship with growth. A 1% increase in private sector credit and total financial assets leads to an increase in growth by 0.3%, respectively. Overall, the results indicate that financial intermediation and the size of the banking system are important for growth. The models have high r-squared, with the exception of the growth model using interest rate spread. All five models have relatively low r-squares which

[2] The negative relations could be related to the multicollinearity effect since it is highly correlated with private sector credit or due to the small sample size

means that changes in the growth variable is not fully explained by the given variables, but there are other variables that may explain the movement in growth.

To improve the five models, control variables are included as dependent variables to account for other factors that explain the changes in the growth variables. These control variables include gross fixed capital formation as an indicator of investment (GFCF), Government expenditure (GOVCON), total exports and imports as an indicator of trade openness (EXPIM), Consumer Price Index as an indicator of inflation and macroeconomic stability (CPI), Life expectancy in number of years as an indicator of health (HEAL), gross percentage of secondary school enrolment as an indicator of education (EDUC) both indicators of human capital, and four separate dummy variables to capture the impact of the occurrence of four cyclones in a year (CP1, CP2, CP3 and CP4). Depending on the model specification and theory, the lag variables of financial development (a maximum of two lags) are added and the insignificant variables are omitted to select the right model. The regression model (equation 3.2.2) results show significant coefficients, are high r-squared and pass the robustness test (no serial correlation, no heroskesdasticity and are normally distributed).

Table 4 6 Johansen Cointegration Procedure Results (Models 1.1 and 2.1)

	Johansen Cointegration Procedure for Equations 3.2.2a and 3.2.2b		**Null hypothesis**	**Existence of cointegration**
Model 1.1	LRGDP	LPSC, LGFCF, LGOVCON LEXPIM, INFL, LHEAL, LEDUC, LEDUC1	r≤7*	√ r≥7
Model 2.1	LRGDPPC	LPSC, LGFCF, LGOVCON LEXPIM, INFL, LHEAL, LEDUC, LEDUC1	r≤9*	√ r≥9

Source: Author's calculation (2015); *denotes rejection of the null hypothesis at the 5% level (see Appendix B for model specification)

The Johansen procedure results in Table 4.6, using private sector credit as the only financial development explanatory variable, show that there are seven or more long-run relationships between all the selected variables with real GDP (model 1.1) and nine or more long-run relationships with real GDP per capita (model 2.1) as the dependent variables.

Table 4 7 Regression Results of the Growth Model using Private Sector Credit as the Independent Variable (Equations 3.2.2a and 3.2.2b)

	Dependent Variable	
Independent Variables	**LRGDP (Model 1.1)**	**LRGDPPC (Model 2.1)**
C	-3.41**	10.0***
PSC(-2)	0.22***	0.23***
LGFCF(-1)	0.05**	0.09***
LGOVCON(-1)		-0.16***
LGOVCON(-2)	0.03	
LEXPIM	0.19***	0.08***
INFL(-1)	-0.003**	-0.004***
LHEAL	2.40***	

LEDUC	-0.13***	-0.18***
LEDUC1	0.32***	0.32***
CP1	-0.03***	-0.04***
CP2	-0.03**	-0.04***
CP3	-0.03**	-0.04***
CP4	-0.07***	-0.06***
N	30	30
R-Squared	0.995	0.909

Source: Author's calculations (2015); ***, **, *, indicate statistical significance at the 1, 5, and 10 percent levels, respectively; LPSC – log Private Sector Credit (as % of GDP); LRGDP – log Real Gross Domestic Product; LRGDPPC- log Real Gross Domestic Product per capita
(see Appendix A for description of control variables)

The regression model 1.1 (equation 3.2.2a) uses private sector credit as the independent variable to test the relationship between private sector credit (indicator of credit allocation) and growth (Table 4.7). The results show that there is a positive and significant relationship between private sector credit growth (lagged for a two year period) and growth, at the 1% significance level. It is estimated that a one percent increase in credit allocation in two years increases growth by 0.2 percent in growth in the current period. This means that the impact of credit financing into the real sector is rather slow. These results support the findings of the weak Monetary Policy transmission mechanism in Pacific Island Countries by an International Monetary Fund study (Dunn et al., 2011). Furthermore, capital investment has a positive and significant relationship with growth at the 5% level; a one percent increase in capital investment leads to a 0.05 percent increase in growth (or a 0.09 percent increase in economic development, model 2.1). Trade openness also has a positive and significant relationship with growth at the 1% level; it is estimated that a one percent increase in trade openness increases growth by 0.2 percent (or a 0.08 percent increase in economic development). The human capital investment variable represented by increase in life expectancy is important for growth. The education variable (mainly primary school enrolment) is deemed important for growth, although the other component of education variable – secondary school enrolment has a negative relationship with growth. The negative relationship in the education coefficient is due to a fall in the gross rate of secondary school enrolment in the decade leading up to 1990. World Bank statistics show a 5.7 percent fall in gross secondary school enrolment between 1986 and 1992 which is likely due to the impact of Tropical Cyclone Uma (1987), a category 5 cyclone that destroyed much infrastructure including schools. The negative coefficient may also be associated with the probable short sample size[3]. However, the coefficients of both primary and secondary enrolment in the model still result in a positive impact of overall education on both real GDP growth and real GDP growth per capita. This may also mean that primary school enrolment has a greater effect than secondary school enrolment, and is therefore an appropriate measure of human capital accumulation. On the other

[3] Further in-depth studies are recommended to further explore the impact of secondary enrolment on growth for Pacific Island Countries, aside from the finance-growth relationship study

hand, inflation and occurrence of cyclones are both detrimental to Vanuatu's growth. Model 1.1(equation 3.2.2a) regression results show that a 1 percent increase in inflation rate lagged by a one year period leads to a decline in growth by a -0.003 percent at the 5% significance level (or -0.004 percent in economic development at the 1% significance level). Likewise, the occurrence of one cyclone contributes to the decline in growth by -0.03 percent at the 1% significance level (or -0.04 percent in economic development) and the occurrence of two cyclones and three cyclones in a year contributes to a decline in growth by -0.03 percent at the 5% significance level; whilst the occurrence of four cyclones in a year has a greater impact on growth, reducing growth by -0.07 percent at the 1% significance level (or -0.06 percent in economic development). Furthermore, the empirical results show that a one percent increase in gross fixed capital formation (as a share of GDP) lagged by a one year period increases growth by a 0.05 percent at the 5% significance level; a one percent increase in total exports and imports (as a share of GDP) increases growth by 0.19 percent at the 1% significance level; an increase in life expectancy by one year increases growth by 2.4 percent at the 1% significance level; a one percent increase in the gross rate of primary school enrolment increases growth by 0.32 percent at the 1% significance level (despite an increase in the gross rate of secondary school enrolment, which contributed to a decline in growth by 0.13 percent at the 1% significance level). These estimated results show that other factors such as capital accumulation and investment, trade openness and human capital (with the exception of education represented by secondary school enrolment) have a positive and significant impact on GDP growth. Aside from these factors, financial intermediation through the increase in credit from the banking system to the private sector has a positive impact on growth, however with a lag (two periods).

Table 4 8 Johansen Cointegration Procedure Results (Models 1.2 and 2.2)

	Johansen Cointegration Procedure for Equations 3.2.2a and 3.2.2b		**Null hypothesis**	**Existence of cointegration**
Model 1.2	LRGDP	LM3, LGFCF, LGOVCON LEXPIM, INFL, LHEAL, LEDUC, LEDUC1	r≤4*	√ r≥4
Model 2.2	LRGDPPC	LM3, LGFCF, LGOVCON LEXPIM, INFL, LHEAL, LEDUC, LEDUC1	r≤4*	√ r≥4

Source: Author's calculation (2015); *denotes rejection of the null hypothesis at the 5% level (see Appendix B for model specification)

The Johansen procedure results in Table 4.8 using liquid liabilities as the only financial development explanatory variable, shows that there are four or more long-run relationships between all the selected variables with real GDP (model 1.2) and four or more long-run relationships with real GDP per capita (model 2.2) as the dependent variables.

Table 4 9 Regression Results of the Growth Model using Liquid Liabilities as the Independent Variable (Equations 3.2.2a and 3.2.2b)

	Dependent Variable	
	LRGDP	**LRGDPPC**

Independent Variables	(Model 1.2)	(Model 2.2)
C	4.61***	18.7***
LM3(-2)	0.22***	0.21***
LGFCF(-2)	-0.06**	0.09***
LGOVCON	0.12***	
LGOVCON(-1)		-0.13***
LEXPIM	0.26***	0.19***
INFL(-1)	-0.007***	-0.008***
LHEAL		-2.81***
LEDUC		-0.07***
LEDUC1	0.43***	0.61***
CP1		-0.02***
CP4	-0.07***	-0.06***
N	30	30
R-Squared	0.994	0.915

Source: Author's calculations (2015); ***, **, *, indicate statistical significance at the 1, 5, and 10 percent levels, respectively; LM3 – log of Liquid Liabilities (as % of GDP); LRGDP – log Real Gross Domestic Product; LRGDPPC- log Real Gross Domestic Product per capita
(see Appendix A for description of control variables)

The regression model 1.2 (equations 3.2.2a and 3.2.2b) uses liquid liabilities (to GDP) as the independent variable to test the relationship between liquid liabilities and growth. The results show a positive and significant relationship between financial deepening (growth in liquid liabilities) (lagged for a two year period) and growth, at the 1% significance level (see Table 4.9). It is estimated that a one percent increase in financial deepening for two years increases growth by 0.2 percent in growth in the current period. This result again supports evidence of a weak transmission mechanism of bank credit financing to the real sector and weak Monetary Policy transmission (Dunn, Davies, Yang, Wu, & Wang, 2011). On the other hand, the increase in gross fixed capital formation as an indicator of capital accumulation and investment leads to a 0.09 percent increase in economic development, at the 1% significance level; however the negative impact of growth may be related to the period of a low number of aid-funded project implementations. Government expenditure and trade openness also have a positive and significant relationship with growth at the 1% level; a one percent increase in each of these variables leads to a 0.12 percent and 0.26 percent in GDP growth, respectively. The results also support the positive impact of human capital accumulation specifically through primary school enrolment on growth, aside from a negative relationship with secondary school enrolment, explained by a fall in the level in the period leading up to the 1990s. On the other hand, inflation and the occurrence of cyclones are detrimental to Vanuatu's growth. Model 1.2 results show that a one percent increase in inflation (lagged by a one year period) contributes to a decline in growth by a -0.007 percent (or -0.008 percent in economic development in model 2.2) at the 1% significance level. Likewise, the occurrence of a cyclone a year contributes to a decline in growth by -0.02 percent in economic development; whilst the occurrence of four cyclones in a year has a greater impact on growth, reducing growth by -0.07 percent (or 0.06 percent in economic

development) at the 1 % significance level. These estimated results show that an increase in financial deepening (depth of the banking system) and the size of the banking system have a positive impact on economic growth and development, however with a lagged period of two years.

Table 4 10 Johansen Cointegration Procedure Results (Models 1.3 and 2.3)

	Johansen Cointegration Procedure for Equation 3.2.2		**Null hypothesis**	**Existence of cointegration**
Model 1.3	LRGDP	LTFA, LGFCF, LGOVCON LEXPIM, INFL, LHEAL, LEDUC, LEDUC1	r≤2*	√ r≥2
Model 2.3	LRGDPPC	LTFA, LGFCF, LGOVCON LEXPIM, INFL, LHEAL, LEDUC, LEDUC1	r≤3*	√ r≥3

Source: Author's calculation (2015); *denotes rejection of the null hypothesis at the 5% level; (see Appendix B for model specification)

The Johansen procedure results in Table 4.10 using total financial assets as the only financial development explanatory variable, show that there are two or more long-run relationships between all the selected variables with real GDP (model 1.3) and three or more long-run relationships with real GDP per capita (model 2.3) as the dependent variables.

Table 4 11 Regression Results of the Growth Model using Total Financial Assets as the Independent Variable (Equations 3.2.2a and 3.2.2b)

	Dependent Variable	
Independent Variables	**LRGDP (Model 1.3)**	**LRGDPPC (Model 2.3)**
C	2.18	9.87***
LTFA	-0.19**	
LTFA(-2)	0.15**	-0.08***
LGOVCON	0.15**	0.17***
LGOVCON(-2)	0.08*	
LEXPIM	0.29***	0.18***
INFL		0.005***
INFL(-1)	-0.01***	-0.006***
LEDUC		-0.13***
LEDUC1		0.21**
LHEAL	1.24*	
CP4	-0.07***	-0.10***
N	30	30
R-Squared	0.989	0.875

Source: Author's calculations (2015); ***, **, *, indicate statistical significance at the 1, 5, and 10 percent levels, respectively; LTFA – log of Total Financial Assets of the commercial banks (as % of GDP); LRGDP – log Real Gross Domestic Product; LRGDPPC- log Real Gross Domestic Product per capita
(see Appendix A for description of control variables)

The regression model 1.3 (equations 3.2.2a and 3.2.2b) uses total financial assets (to GDP) as the independent variable to test the relationship between total financial assets (indicator of the size of the commercial banking system) and growth. The results show a positive and significant relationship

between the total financial assets of the banking system (lagged for a two year period) and growth at the 5% level (despite a negative relationship found for the current period) (see Table 4.11). It is estimated that a one percent increase in financial assets two years ago increases growth by 0.15 percent in the current period. Unexpectedly, the results show a negative relationship for economic development which may be associated with the small size of the economy and the slowly developing pace of the financial system related to the weak Monetary Policy transmission mechanism noted for Vanuatu. On the other hand, the results show a positive and significant relationship between Government Expenditure and Growth, significant at the 5% level (and also lagged by a two year period); a one percent increase in consumption expenditure by the government leads to a 0.15 percent in growth (or a 0.17 percent increase in economic development, model 2.3); the model also estimates a one percent increase in government expenditures (lagged for two years)contributes to a 0.08 percent increase in growth in the current period. The other variable that supports growth is trade openness, which shows that a one percent increase in trade openness increases growth by a 0.29 percent at the 1 % significance level (or 0.18 percent growth in economic development). The primary school enrolment is the only human capital investment indicator that has a positive relationship with economic development at the 5% significance level; a one percent increase in primary school enrolment leads to an increase in economic development by 0.21 percent. However, a negative relationship is noted for secondary school enrolment, given the decline in the level in the period leading to the 1990s. On the other hand, health has a positive and significant relationship with growth (a one percent increase leads to 1.24 percent growth in economic growth) at the 10% significance level. On the other hand, inflation and occurrence of cyclones are detrimental for Vanuatu's growth. Model 1.3 shows that a one percent increase in inflation (lagged by a one year period) contributes to a decline in growth by a 0.01 percent (or -0.006 percent in economic development). Likewise, the occurrence of four cyclones in a year has a greater impact on growth, reducing growth by -0.07 percent (or 0.10 percent in economic development) at the 1% significance level. The results also show that other determinants of growth also influence Vanuatu's growth, aside from the lagged (2-year period) impact of financial development alone.

Table 4 12 Johansen Cointegration Procedure Results (Models 1.4 and 2.4)

	Johansen Cointegration Procedure for Equations 3.2.2a and 3.2.2b		**Null hypothesis**	**Existence of cointegration**
Model 1.4	LRGDP	INSP, LGFCF, LGOVCON LEXPIM, INFL, LHEAL, LEDUC, LEDUC1	r≤4*	√ r≥4
Model 2.4	LRGDPPC	INSP, LGFCF, LGOVCON LEXPIM, INFL, LHEAL, LEDUC, LEDUC1	r≤5*	√ r≥5

Source: Author's calculation; *denotes rejection of the null hypothesis at the 5% level
(see Appendix B for model specification)

The Johansen procedure results in Table 4.12 using interest rate spread as the only financial development explanatory variable, show that there are four or more long-run relationships between all the selected variables with real GDP (model 1.4) and five or more long-run relationships with real GDP per capita (model 2.4) as the dependent variables.

Table 4 13 Regression Results of the Growth Model using Interest Rate Spread as the Independent Variable (Equations 3.2.2a and 3.2.2b)

	Dependent Variable	
Independent Variables	**LRGDP (Model 1.4)**	**LRGDPPC (Model 2.4)**
C	0.75	11.5***
INSP	-0.02***	
INSP(-2)	-0.02***	-0.02***
LGFC(-1)	0.07**	
LGFCF(-2)	-0.08***	
LGOVCON	0.13**	0.19***
LGOVCON(-1)		0.14*
LGOVCON(-2)	0.17***	0.10*
LEXPIM	0.17***	0.10***
INFL(-1)	-0.004**	-0.003*
LEDUC		-0.11***
LHEAL	1.86***	
CP1		-0.02**
CP2		-0.04**
CP3	-0.04***	-0.05***
CP4	-0.057***	-0.06***
N	30	30
R-Squared	0.996	0.889

Source: Author's calculations (2015); ***, **, *, indicate statistical significance at the 1, 5, and 10 percent levels, respectively; INSP – Interest Rate Spread (%); LRGDP – log Real Gross Domestic Product; LRGDPPC- log Real Gross Domestic Product per capita (see Appendix A for description of control variables)

The results of the regression model 1.4 (equations 3.2.2a and 3.2.2b) show a negative and significant relationship between the higher interest rate spread (inefficiencies of the banking system) and growth at the 5% significance level (see Table 4.13). It is estimated that a one percent increase in bank inefficiencies (higher interest rate spread or high borrowing rate) reduces GDP growth by -0.02 percent (the same result was noted for GDP per capita). The lagged impact could be partially explained by the weak transmission mechanism noted for Vanuatu, the high over-head cost of banks and the low competition amongst banks due to the few banks. On the other hand, the results show gross fixed capital formation (as an indicator of accumulative capital and investment) lagged by a period has a positive and significant relationship with growth, at the 5% significance level; a one percent increase in capital investment increases growth by 0.07 percent. Furthermore, government expenditure (also lagged by a two year period) also has a positive and significant relationship with growth at the 5% significance level (and 1% significance level); a one percent increase in government

expenditure in the current period and lagged by a two year period increases GDP growth in the current period by 0.13 percent and 0.17 percent, respectively (positive and significant relationships were also shown for GDP per capita, model 2.4). Trade openness also has a positive and significant relationship with growth at the 1% significance level; a 1% increase leads to a 0.17 percent increase in growth (or 0.10 percent growth in economic development). On the other hand, the health of human capital investment has a positive relationship with growth (a 1.86 percent growth in economic growth), despite a negative impact on secondary school enrolment. Inflation and occurrence of cyclones are detrimental for Vanuatu's growth. Model 1.4 regression results show that a one percent increase in inflation (lagged by a one year period) contributes to a decline in growth by a -0.004 percent (or -0.003 percent in economic development). Likewise, the occurrence of more than three cyclones impacts economic growth; the occurrence of one cyclone, two cyclones, three cyclones and four cyclones in a year reduces economic development by -0.02 percent, -0.04 percent, -0.05 percent and -0.06 percent, respectively.

4.2.3 Johansen Cointegration Procedure Results for the VECM

Following on from the unit root tests and stationary tests, both the lag length selection criterion, that is the AIC and SBC, revealed that the optimal lag length for all models (see Appendix B) is one. Therefore, this is used in the Johansen Cointegration Procedure and the VECM model. To proceed with the Johansen Cointegration Procedure and the problem of high collinearity, the model uses only six variables. The Johansen Cointegration Procedure is carried out using only six variables (choosing the ones that are viable through economic theory), including only two financial development indicators: liquid liabilities (to GDP) and private sector credit (to GDP). The results (using variables in their logs) are shown in Table 4.14. The following test is carried out:

Null hypothesis H0: Series are not cointegrated.

Alternative hypothesis H1: There is at most one or more cointegration equations

Decision: Reject the null hypothesis if the p-Value is less than 5%. The implication of rejecting the null hypothesis (H0) is that there is an underlying relationship between the variables selected.

Table 4 14 Johansen Cointegration Procedure for Multiple Cointegration Vectors (Model 3.1)

H0:	**H1:**	**Trace Statistics**	**0.05 Critical Values**	**Prob.****	**H0:**	**H1:**	**Max-Eigen Statistics**	**0.05 Critical Values**	**Prob.****
r=0*	r>0	227.3085	95.75366	0.0000	r=0*	r>0	100.2446	40.07757	0.0000
r≤1*	r>1	127.0639	69.81889	0.0000	r≤1*	r>1	63.00034	33.87687	0.0000
r≤2*	r>2	64.06361	47.85613	0.0008	r≤2*	r>2	35.06773	27.58434	0.0045
r≤3	r>3	28.99588	29.79707	0.0616	r≤3	r>3	17.50982	21.13162	0.1493
r≤4	r>4	11.48606	15.49471	0.1833	r≤4	r>4	11.46747	14.26460	0.1323
r≤5	r>5	0.018589	3.841466	0.8914	r≤5	r>5	0.018589	3.841466	0.8914

Source: Author's calculation (2015); * denotes rejection of the hypothesis at the 5% significance level. ** MacKinnon-Haug-Michelis (1999) p-values

Both the Trace statistics and the Max-Eigen statistics results show that the p-value of the null hypothesis that the number of cointegration equations (r) is at least 3, $r \leq 3$, is lower than 0.05. Therefore, the null hypothesis $r \leq 3$ is not rejected at a 5% significance level. This means that there are at least three cointegration equations and we may conclude that the variables in model 3.1 (see Appendix B) have a long-run equilibrium relationship.

Table 4 15 Normalized Cointegrating Coefficients (Standard errors in parenthesis)

	LRGDP	**LM3**	**LPSC**	**LEXPIM**	**LODA**	**LGOVCON**
CE1	1.000000	-1.623748	1.040389	-0.313224	-0.369090	2.070212
		(0.11368)	(0.10837)	(0.05856)	(0.07778)	(0.14941)
CE2		1.000000	-0.541369	-0.216926	0.294819	-1.366095
			(0.06489)	(0.02351)	(0.04462)	(0.08790)
CE3			1.000000	-0.244932	-0.938509	1.827122
				(0.04420)	(0.08982)	(0.21820)

Source: Author's calculation (2015); LRGDP – log Real Gross Domestic Product; LM3 – log Liquid Liabilities (as % of GDP); LPSC – log Private Sector Credit (as % of GDP); LGFCF – log of Gross Fixed Capital Formation (as % of GDP); LEXPIM - Exports plus Imports (as %of GDP); LCPI – inflation (%); LGOVCON – log of Government Expenditure; LODA – log of overseas-development aid (% of GDP); LHEAL – log of life expectancy (in years).

Since we have identified the existence of three cointegration equations, we can say that a stable equilibrium relationship is present (see Table 4.15). In the first cointegration equation (Cointegration equation (1)), the results are normalized on the GDP growth. Owing to the normalisation process, the signs are reversed to enable proper interpretation. The ratio of liquid liabilities to GDP, exports and donor-aid into the country have the expected positive signs and are statistically significant according to the standard error values shown. The coefficients are interpreted as follows:

- A 1% increase in liquid liabilities leads to a 1.62% increase in the real GDP in the long run
- A 1% increase in total exports plus imports (an indicator of trade openness) leads to a 0.31% increase in the real GDP in the long run
- A 1% increase in gross donor-aid leads to a 0.37% increase in the real GDP in the long run

However, the ratio of private sector credit to GDP and ratio of Government expenditure to GDP exhibit negative relationships with the GDP growth and are both statistically significant. The significant results show that the ratio of liquid liabilities to GDP (as an indicator of financial deepening, therefore financial development) through the banking system positively influences Vanuatu's economic growth in the long-run.

4.2.4 Vector Error Correction Model (VECM) Results

The variables have long-run relationships and are cointegrated, thus we proceed to develop a restricted Vector-Auto-Regression Model (VAR) which is a VECM. Table 4.16 summarises the VECM results and shows the short-run relationships and the adjustment to the long-run. Engle and Granger (1987)have proven that if a set of series are co-integrated, there exists a mechanism "error-correction model" which causes the variables to move closely together over time, while allowing a wide range of short-run dynamics. Using the Johansen approach (Johansen (1988); Johansen and Juselius (1990)), the concept of short-run and long-run causality is found by identifying the co-integration relationship between the financial development variable and the economic growth variable suggesting that they may behave in a different way in the short-run, but will converge towards a common behaviour in the long-run. This dynamic relationship is described by the error correction model (ECM) demonstrating the short-run and long-run adjustment parameter. The Wald statistics explain the short run causality between the independent and dependent variables for the significance of the coefficients of the series. The coefficients of the error correction term (ECT) explains the intensity of the long-run causality effect and denotes the speed that deviations from the long run equilibrium are removed due to variations in each variable.

4.2.4..1 Short-Run Causality

Table 4.16 shows the short-run relationships. In the short-run, the ratio of private sector credit to GDP (lagged by two periods) has a positive and statistically significant relationship with GDP at the 5% level. This supports the notion that there is a short-run causality running from financial development to economic growth, however with a lagged impact of a two year period. Exports plus imports (lagged by one and two year periods) and government expenditure (lagged by one and two year periods) also exhibit a positive and statistically significant relationship with GDP at the 5% level, respectively. This is despite the negative and statistically significant short-run relationship found for GDP growth (lagged by a one year period) and overseas donor-aid (lagged by one and two year periods) with growth at the 10% level, respectively.

Table 4 16 Results of the VECM for the LRGDP Model 3 – Short-Run Relationships (Equation 3.2.5 & 3.2.6)

Dependent Variables	D(LRGDP)	D(LM3)	D(LPSC)	D(LEXPIM)	D(LODA)	D(LGOVCONR)
Independent Variables	Coefficients (t-statistics in parenthesis)					
D(LRGDP(-1))	-0.537	0.570751	0.218024	-1.562786	1.940865	0.195352
	[-2.39448]**	[0.51103]	[0.35910]	[-1.55817]	[1.13188]	[0.21248]
D(LRGDP(-2))	-0.113762	-0.643143	0.301364	-2.06045	-1.111355	0.811412
	[-0.66292]	[-0.75254]	[0.64868]	[-2.68475]**	[-0.84700]	[1.15338]
D(LM3(-1))	-0.004533	-0.068923	0.065847	-0.35016	-1.992034	-0.134674
	[-0.05809]	[-0.17733]	[0.31166]	[-1.00325]	[-3.33833]**	[-0.42093]
D(LM3(-2))	0.045021	-0.152775	-0.413247	-0.483126	-1.586876	-0.22783
	[0.58731]	[-0.40019]	[-1.99132]*	[-1.40926]	[-2.70748]**	[-0.72499]
D(LPSC(-1))	0.06941	-0.183945	-0.241213	0.202852	0.668685	0.231341
	[1.05503]	[-0.56143]	[-1.35432]	[0.68945]	[1.32934]	[0.85776]
D(LPSC(-2))	0.141958	0.006991	-0.285335	-0.32007	-0.632055	-0.039967
	[2.43535]**	[0.02408]	[-1.80815]*	[-1.22779]	[-1.41816]	[-0.16725]
D(LEXPIM(-1))	0.318947	-0.223167	-0.833927	0.379637	-1.392493	-0.093282
	[3.78291]**	[-0.53150]	[-3.65353]**	[1.00683]	[-2.16008]**	[-0.26988]
D(LEXPIM(-2))	0.177711	-0.083994	-0.432483	0.445573	0.374205	0.12854
	[2.51825]**	[-0.23900]	[-2.26376]**	[1.41183]	[0.69353]	[0.44432]
D(LODA(-1))	-0.101821	0.21984	0.140409	-0.047249	1.466074	0.206827
	[-1.87055]*	[0.81096]	[0.95280]	[-0.19409]	[3.52253]**	[0.92684]
D(LODA(-2))	-0.090069	0.241972	0.145315	-0.097933	0.252678	-0.063418
	[-2.20566]**	[1.18984]	[1.31447]	[-0.53625]	[0.80928]	[-0.37883]
D(LGOVCONR(-1))	0.228678	-0.726552	-0.380204	0.747415	-1.036261	-0.15501
	[2.18789]**	[-1.39582]	[-1.34367]	[1.59897]	[-1.29670]	[-0.36177]
D(LGOVCONR(-2))	0.180526	-0.06941	-0.119816	0.855179	0.604851	0.125971
	[3.12708]**	[-0.24143]	[-0.76664]	[3.31233]**	[1.37030]	[0.53228]
C	0.011057	0.051072	0.095852	0.097488	0.122663	-0.014258
	[1.11917]	[1.03797]	[3.58360]**	[2.20634]**	[1.62376]	[-0.35202]
R-squared	0.813203	0.444756	0.756605	0.733526	0.790593	0.556138
F-statistic	3.772954	0.694209	2.694073	2.385684	3.272005	1.085893
Log likelihood	81.38167	34.82357	52.5	37.94313	22.39057	40.46656
Akaike AIC	-4.509081	-1.298178	-2.517241	-1.51332	-0.440729	-1.687349
Schwarz SC	-3.754711	-0.543807	-1.762871	-0.75895	0.313641	-0.932979

Source: Author's calculation (2015); **, * indicate statistical significance at the 5 and 10 percent levels, respectively; LPSC – log Private Sector Credit (as % of GDP); LM3 – log Liquid Liabilities (as % of GDP); LTFA - log Total Financial Assets (% of GDP); INSP – Interest Rate Spread (%); LRGDP – log Real Gross Domestic Product.

Testing for Granger Non-Causality

The results on the short-run relationship are justified using the Wald test to test the coefficients of the model 3.1 (see Appendix B) to determine if a short-run causality runs from lags (one lag and two lags) of the independent variables to the dependent variable. The following hypotheses are tested:

Null H0: Lagged values of coefficients in each equation are zero. This means there is no short –run causality relationship with the dependent variable or X_t does not cause Y_t.

Alt H1: Lagged values of coefficients in each equation are not zero. This means there is a short-run causality relationship with the dependent variable or X_t does causeY_t.

Decision: Reject the null hypothesis (H0) if the chi-square p-value is less than 5%

Table 4 17 Testing for Granger non-causality - short-run relationship for the LRGDP

	Dependent Variables					
Independent Variables	DLRGDP	DLM3	DLPSC	DLEXPIM	DLODA	DLGOVCONR
DLRGDP(-1) and DLRGDP(-2)	0.0563	0.5922	0.7906	0.0167**	0.2802	0.5137
	C(4)=C(5)=0	C(20)=C(21)=0	C(36)=C(37)=0	C(52)=C(53)=0	C(68)=C(69)=0	C(84)=C(85)=0
DLM3(-1) and DLM3(-2)	0.7764	0.9228	0.0451**	0.3483	0.0018**	0.7669
	C(6)=C(7)=0	C(22)=C(23)=0	C(38)=C(39)=0	C(54)=C(55)=0	C(70)=C(71)=0	C(86)=C(87)=0
DLPSC(-1) and DLPSC(-2)	0.0310**	0.8537	0.0816	0.3649	0.1457	0.6806
	C(8)=C(9)=0	C(24)=C(25)=0	C(40)=C(41)=0	C(56)=C(57)=0	C(72)=C(73)=0	C(88)=C(89)=0
DLEXPIM(-1) and DLEXPIM(-2)	0.0008**	0.8574	0.0012**	0.3679	0.1457	0.6754
	C(10)=C(11)=0	C(26)=C(27)=0	C(42)=C(43)=0	C(58)=C(59)=0	C(74)=C(75)=0	C(90)=C(91)=0
DLODA(-1) and DLODA(-2)	0.075	0.4923	0.4185	0.8474	0.0003**	0.2769
	C(12)=C(13)=0	C(28)=C(29)=0	C(44)=C(45)=0	C(60)=C(61)=0	C(76)=C(77)=0	C(92)=C(93)=0
DLGOVCON(-1) and DLGOVCON(-2)	0.0057**	0.3318	0.4024	0.0041**	0.0305**	0.6725
	C(14)=C(15)=0	C(30)=C(31)=0	C(46)=C(47)=0	C(62)=C(63)=0	C(78)=C(79)=0	C(94)=C(95)=0

Source: Author's calculation (2015); C – coefficient; ** denotes rejection of the hypothesis at the 5%; LRGDP – log Real Gross Domestic Product; LM3 – log Liquid Liabilities (as % of GDP); LPSC – log Private Sector Credit (as % of GDP); LEXPIM – log Total Exports plus Imports (as % of GDP); LODA – log Overseas Donor-Aid (as % of GDP); LGOVCON – log of Government Expenditure (as % of GDP)

The results in Table 4.17 (for equations 3.2.7 and 3.2.8) show a number of the coefficients have p-values less than 5%. This means that the null hypothesis of the lagged values of the coefficient in each equation is equal to zero is rejected, which implies there is a short-run causality relationship. The results also show the null hypothesis that the coefficients of the relationship between the two lagged terms of private sector credit, (DLPSC(-1) and DLPSC(-2)) are zero is rejected at the 5% significance level. This implies that there is a short-run causality running from private sector credit to GDP growth. This Granger Non-Causality test shows that in terms of the financial development-economic growth relationship, there is a uni-directional causality between private sector credit and real GDP growth, which implies that banking credit to the private sector Granger causes real GDP (growth); however, there is no bi-directional causality. Therefore, in terms of the financial development and growth relationship, these estimated results show that for Vanuatu, the direction of causality runs from financial development to economic growth which justifies similar findings and earlier research on the finance-growth relationship for developing countries by Christopoulous and Tsionas (2004) who used a dynamic panel analysis of 10 developing countries (1970-2000).

Aside from the role of financial development, the hypothesis that there is no short-run causality running from the lags of total exports plus imports and government expenditure to GDP is also rejected at the 5% significance level. This means that trade openness and government expenditure also cause Vanuatu's economic growth in the short-run (and exports plus imports cause real GDP, a bi-directional causality between the two variables). On the other hand, the (Wald) causality test continues to show that there are six other short-run causality running from the lag (two lags) of the independent variables to dependent variables. The short-run causality runs as follows: liquid liabilities Granger causes private sector credit; exports plus imports (trade openness) Granger cause private sector credit; real GDP Granger causes exports plus imports (trade openness); Government expenditure Granger causes exports plus imports (trade openness); liquid liabilities Granger causes overseas donor aid; and the lag of overseas donor aid Granger causes overseas donor aid in the current period.

4.2.4..2 Long-Run Causality

Table 4.18 summarises the results of the long-run relationships. The error correction coefficients (ECT) indicate the adjustment to the long run as well as long run causality are expected to be negative and significant coefficients. The results show that in cointegration equation (1), private sector credit to GDP including overseas aid is negative and statistically significant at the 5% level, respectively. This means that the adjustment to the long run is taking place in these models. This is contrary to ratio liquid liabilities and government expenditure models which have the correct sign but are statistically insignificant. In the third cointegration equation, only private sector credit is negative and statistically significant at the 5% level, which implies that adjustment to the long-run is taking place for model 3.1 (see Appendix B).

Table 4 18 Results of the VECM (model 3.1) for the LRGDP Model – Long-Run Relationships (Equation 3.2.5 & 3.2.6)

Dependent Variables	D(LRGDP)	D(LM3)	D(LPSC)	D(LEXPIM)	D(LODA)	D(LGOVCONR)
Independent Variables	Coefficients (t-statistics in parenthesis)					
CointEq1	0.408758	-1.329281	-1.527652	1.251419	-4.336116	-0.058336
	[2.06529]*	[-1.34863]	[-2.85114]**	[1.41383]	[-2.86540]**	[-0.07190]
CointEq2	0.266797	-0.133065	0.164357	1.539752	2.452886	0.001277
	[3.52941]**	[-0.35347]	[0.80313]	[4.55461]**	[4.24392]**	[0.00412]
CointEq3	-0.01397	0.08516	-0.383133	-0.115161	0.674019	-0.0733
	[-0.29250]	[0.35803]	[-2.96310]**	[-0.53914]	[1.84570]*	[-0.37436]

Source: Author's calculation (2015); ** and * indicate statistical significance at the 5 and 10 percent levels, respectively; LPSC – log Private Sector Credit (as % of GDP); LM3 – log Liquid Liabilities (as % of GDP); LTFA - log Total Financial Assets (% of GDP); INSP – Interest Rate Spread (%); LRGDP – log Real Gross Domestic Product.

The VECM model justifies the findings given above on the positive and statistically significant impact of financial intermediation (represented by banking credit to the private sector, although lagged by a two year period) on economic growth (Table 4.18) despite there being no evidence shown for the other indicator of financial development [ratio of liquid liabilities to GDP (represents financial deepening)]. On the other hand, ratio of liquid liabilities (financial deepening), exports plus imports (trade openness and overseas aid have a positive long-run equilibrium relationship with growth. The results from model 3.1 (see Appendix B) also show that although private sector credit has a negative long-run equilibrium relationship with growth, adjustments to the long run take place in this model.

4.3 Contribution of major financial sector development reforms to major economic sectors of Vanuatu's economy

4.3.1 Regression Results

To investigate the impact of financial development on growth on major economic sectors and show the impact of the Comprehensive Reform Program implemented in 1997, a number of models using the similar form of 3.2.2a and 3.2.2b are regressed using a set of dependent variables indicative of productivity growth (GDP and GDP per capital growth), capital accumulation and investment (Gross Fixed Capital Formation) and sector growth (Agriculture, Industry and Services).

Table 4 19 Johansen Cointegration Procedure Results (Models 4.1- 4.6)

	Johansen cointegration procedure for Equation 3.2.2a and 3.2.2b		**Null hypothesis**	**Existence of cointegration**
Model 4.1	LRGDP	LM3, INFL, LEXPIM, LODA, LGOVCON, LFDI, LHEAL, LEDUC	r≤8*	√ r≥8
Model 4.2	LRGDPPC	LM3, INFL, LEXPIM, LODA, LGOVCON, LFDI, LHEAL, LEDUC	r≤8*	√ r≥8
Model 4.3	LGFCF	LM3, INFL, LEXPIM, LODA, LGOVCON, LFDI, LHEAL, LEDUC	r≤7*	√ r≥7
Model 4.4	LAGRIC	LM3, INFL, LEXPIM, LODA, LGOVCON, LFDI, LHEAL, LEDUC	r≤7*	√ r≥7
Model 4.5	LINDUS	LM3, INFL, LEXPIM, LODA, LGOVCON, LFDI, LHEAL, LEDUC	r≤7*	√ r≥7
Model 4.6	LSERV	LM3, INFL, LEXPIM, LODA, LGOVCON, LFDI, LHEAL, LEDUC	r≤7*	√ r≥7

Source: Author's calculation; *denotes rejection of the null hypothesis at the 5% level
(see Appendix B for model specification)

The Johansen procedure results in Table 4.19 for the growth models 1-6, using liquid liabilities as the only financial development explanatory variable, show that there are seven or more long-run relationships between all the selected variables with the dependent variables.

Table 4 20Regression Results of Growth Model using Liquid Liabilities as the Independent Variable from 1983-2013 (Equations 3.2.2a and 3.2.2b)

Dependent Variables

	LRGDP (Model4.1)	LRGDPPC (Model4.2)	LGFCF (Model4.3)	LAGRIC (Model4.4)	LINDUS (Model4.5)	LSERV (Model4.6)
C	3.09***	9.05***	-8.41***	2.38***	-8.26***	1.88*
LM3	0.09***	-0.09***		-0.17***		0.20***
INFL					0.01*	
EXPIM	0.25***	0.12*	0.88***	0.33***		0.19***
LODA		-0.11*	-0.11**			
LGOVCON	0.11**	0.20***	0.48***		0.72***	0.18***
LFDI		0.12*			0.07*	-0.02*
LHEAL	0.34**			0.36*		0.35*
LEDUC	0.30***			0.21***		
CP3	-0.03*	-0.04*				-0.05**
CP4	-0.06***	-0.08***		-0.09**		-0.08***
N	32	32	32	31	31	31
R-Squared	0.991	0.611	0.949	0.913	0.853	0.991

Source: Author's calculations (2015); ***, **, *, indicate statistical significance at the 1, 5, and 10 percent levels, respectively; LRGDP – log Real Gross Domestic Product; LRGDPPC- log Real Gross Domestic Product per capita; LGFCF – log of Gross Fixed Capital Formation (as % of GDP); LAGRIC – log of Agriculture sector; LINDUS – log of Industry sector; LSERV – log of services sector; LM3 – log Liquid Liabilities (as % of GDP)
(see Appendix A for description of control variables)

The regression results of models 4.1-4.6 for equations 3.2.2a and 3.2.2b for the period 1983 - 2013 based on the ratio of liquid liabilities as a measure of financial development show that financial deepening has a positive relationship with growth in the service sector and overall growth (despite a negative relationship with growth in the agriculture sector and economic development) at the 1% significance level (see Table 4.20). This could mean that policies on financial deepening implemented in the study period (1983-2013) may not have directly focused on the growth in the agriculture sector, and are also related to the slow pace in financial development during the period. However, despite minimal impact shown by financial development indicators, trade openness shows a positive and significant relationship with capital investment, growth in the service sector and industry sector and overall growth and economic development at the 1% significance level. Human capital accumulation also has a positive and significant relationship with growth at the 1% significance level. However, the results show a negative impact of the occurrence of cyclones (four cyclones) on growth in the agriculture and services sectors at a 1% significance level. Therefore, it negatively affected growth.

Table 4 21 Regression Results of the Growth Model using Liquid Liabilities as the Independent Variable from 1983-1996 (Equations 3.2.2a and 3.2.2b)

	Dependent Variables					
	LRGDP (Model4.1)	**LRGDPPC (Model4.2)**	**LGFCF (Model4.3)**	**LAGRIC (Model4.4)**	**LINDUS (Model4.5)**	**LSERV (Model4.6)**
C	6.93***	10.49***	-16.37***	7.01***	4.0***	1.59
LM3	0.22***	0.07*		0.31***		0.19**

INFL		0.01*	0.01**			
LEXPIM	0.16***	0.22**	0.67**	0.52***		0.17**
LODA			-0.22***	-0.52***		
LGOVCON			0.91***	0.38**		0.22*
LFDI		-0.04*		0.50**		
LHEAL		-0.59*	1.51*	-2.46***	3.2***	
LEDUC				-0.80**		
CP1			0.09*	0.05**		-0.04*
CP3					0.13**	-0.06**
CP4	-0.05**	-0.07**		-0.07**	0.12*	-0.10***
N	15	14	14	14	14	14
R-Squared	0.971	0.803	0.946	0.985	0.891	0.987

Source: Author's calculations (2015); ***, **, *, indicate statistical significance at the 1, 5, and 10 percent levels, respectively; LRGDP – log Real Gross Domestic Product; LRGDPPC- log Real Gross Domestic Product per capita; LGFCF – log of Gross Fixed Capital Formation (as % of GDP); LAGRIC – log of Agriculture sector; LINDUS – log of Industry sector; LSERV – log of services sector; LM3 – log Liquid Liabilities (as % of GDP); (See Appendix A for description of control variables)

Before the implementation of the Comprehensive Reform Program in 1997, the regression results of models 4.1-4.6 for equations 3.2.2a and 3.2.2b for the period 1983-1996 show that financial deepening has a positive and significant relationship with growth in the agriculture (1% significance level) and service sectors (5% significance level), overall growth (1% significance level) and economic development (10% significance level) (see Table 4.21). Following independence, the support of financial development was important for the economy. Trade openness and government expenditure show positive and significant relationships with capital investment (at the 5% significance level), growth in the services sector (at the 5% significance level), industry sector (at the significance 5% level) and overall growth and economic development. The regression results showed mixed results on the impact of human capital investment on the major sectors of the economy; however, the negative relationships may mean that these indicators are not important during the early stages of economic growth in the country, and there could be other factors that influence growth. The occurrence of cyclones has a negative impact on the economy; specifically on the growth in the service sector while the occurrence of four cyclones during the year has a tremendous negative impact on all sectors of the economy which is detrimental for economic growth and development.

Table 4 22 Regression Results of the Growth Model using Liquid Liabilities as the Independent Variable from 1997-2013 (Equations 3.2.2a and 3.2.2b)

	Dependent Variable					
	LRGDP (Model4.1)	**LRGDPPC (Model4.2)**	**LGFCF (Model4.3)**	**LAGRIC (Model4.4)**	**LINDUS (Model4.5)**	**LSERV (Model4.6)**
C	4.79***	11.69***	11.01*	4.76***	-7.96***	5.581***
LM3		-0.49***	-0.97**	0.34***		
INFL						
LEXPIM	0.26***	0.20***	1.07***			
LODA						0.22***

LGOVCON	0.12***	0.13**	0.96***		0.71***	0.17***
LFDI			-0.23*			-0.23***
LHEAL	0.55***	0.29*	-1.8*	0.92***		0.48***
LEDUC						-0.64***
CP1						0.02**
N	17	17	17	17	17	17
R-Squared	0.993	0.908	0.957	0.922	0.777	0.993

Source: Author's calculations (2015); ***, **, *, indicate statistical significance at the 1, 5, and 10 percent levels, respectively; LRGDP – log Real Gross Domestic Product; LRGDPPC- log Real Gross Domestic Product per capita; LGFCF – log of Gross Fixed Capital Formation (as % of GDP); LAGRIC – log of Agriculture sector; LINDUS – log of Industry sector; LSERV – log of services sector; LM3 – log Liquid Liabilities (as % of GDP); (See Appendix A for description of control variables)

Following the implementation of the Comprehensive Reform Program, the regression results of models 4.1-4.6 for equations 3.2.2a and 3.2.2b for the period 1997-2013 show that financial deepening has a positive and significant relationship with growth in the agriculture sector at the 1% significance level but a negative relationship with capital investment and economic development (see Table4.22). Its impact on other sectors was insignificant, which means that there are factors that supported growth post-CRP implementation. The results also show trade openness and government expenditure are important for capital investment, with government expenditure showing a greater role in that period. A positive impact of the post-CRP implementation is that government expenditure became important for growth in the industry and service sectors, economic development and overall growth, as a result of the implemented policies that focused on improvement in the operation of certain government departments. Aid was also important for growth in the service sector. As in the previous period, the results further show mixed results on the impact of human capital investment on the major sectors of the economy. The health coefficient is positively related to economic development and growth. However, there remains the possibility that there are other factors that have greater influence on growth.

Table 4 23 Johansen Cointegration Procedure Results (Models 5.1 – 5.6)

	Johansen Cointegration Procedure for Equations 3.2.2a and 3.2.2b		**Null hypothesis**	**Existence of cointegration**
Model 5.1	LRGDP	LPSC, INFL, LEXPIM, LODA, LGOVCON, LFDI, LHEAL, LEDUC	r≤7*	√ r≥7
Model 5.2	LRGDPPC	LPSC, INFL, LEXPIM, LODA, LGOVCON, LFDI, LHEAL, LEDUC	r≤7*	√ r≥7
Model 5.3	LGFCF	LPSC, INFL, LEXPIM, LODA, LGOVCON, LFDI, LHEAL, LEDUC	r≤7*	√ r≥7
Model 5.4	LAGRIC	LPSC, INFL, LEXPIM, LODA, LGOVCON, LFDI, LHEAL, LEDUC	r≤7*	√ r≥7
Model 5.5	LINDUS	LPSC, INFL, LEXPIM, LODA, LGOVCON, LFDI, LHEAL, LEDUC	r≤6*	√ r≥6
Model 5.6	LSERV	LPSC, INFL, LEXPIM, LODA, LGOVCON, LFDI, LHEAL, LEDUC	r≤7*	√ r≥7

Source: Author's calculations (2015); *denotes rejection of the null hypothesis at the 5% level

(see Appendix B for model specification)

The Johansen procedure results in Table 4.23 for the growth models 5.1-5.6 using private sector credit as the only financial development explanatory variable, show that there are seven or more long-run relationships between all the selected variables with the dependent variables.

Table 4 24Regression Results of the Growth Model using Private Sector Credit as the Independent Variable from 1983-2013 (Equations 3.2.2a and 3.2.2b)

	Dependent Variables					
	LRGDP (Model5.1)	**LRGDPPC (Model5.2)**	**LGFCF (Model5.3)**	**LAGRIC (Model5.4)**	**LINDUS (Model5.5)**	**LSERV (Model5.6)**
C	2.25*	9.07***	-8.41***	1.18	-6.0***	-0.44
LPSC	0.08*	-0.16***		-1.20***		
INFL						
LEXPIM	0.18***	0.23***	0.88***	0.49***		
LODA			-0.11**			0.27***
LGOVCON	0.19***	0.09*	0.48***		0.79***	0.22***
LFDI				-0.06***		-0.26***
LHEAL		0.47**		0.91***		
LEDUC	0.34***			0.87***	-0.78**	0.31**
CP3		-0.04*				-0.05*
CP4	-0.06**	-0.08***		-0.09**		-0.08**
N	32	32	32	31	31	31
R-Squared	0.985	0.630	0.950	0.927	0.843	0.981

Source: Author's calculations (2015); ***, **, *, indicate statistical significance at the 1, 5, and 10 percent levels, respectively; LRGDP – log Real Gross Domestic Product; LRGDPPC- log Real Gross Domestic Product per capita; LGFCF – log of Gross Fixed Capital Formation (as % of GDP); LAGRC – log of Agriculture sector; LINDUS – log of Industry sector; LSERV – log of services sector; LM3 – log Liquid Liabilities (as % of GDP)
(see Appendix A for description of control variables)

The regression results of models 5.1- 5.6 for equations 3.2.2a and 3.2.2b for the period 1983-2013 show that credit allocation through bank credit to the private sector has a positive and significant relationship with overall economic growth at the10% significance level (despite a negative relationship for the growth in the agriculture sector and economic development) (see Table 4.24). This means a smaller portion of credit was extended to the agriculture sector compared to other sectors. However, despite minimal impact shown by the financial development indicators, trade openness and government expenditure show positive and significant relationships with capital investment, growth in the service sector, industry sector, overall growth and economic development, at the 1% significance level, respectively. Human capital accumulation is also important for growth and development. However, the results show a negative impact of the cyclone (specifically the occurrence of three to four cyclones in a year) on growth in the agriculture and service sectors, thus overall economic growth and development.

Table 4 25 Regression Results of the Growth Model using Private Sector Credit as the Independent Variable from 1983-1996 (Equations 3.2.2a and 3.2.2b)

	Dependent Variables					
	LRGDP (Model5.1)	**LRGDPPC (Model5.2)**	**LGFCF (Model5.3)**	**LAGRIC (Model5.4)**	**LINDUS (Model5.5)**	**LSERV (Model5.6)**
C	2.56**	11.2***	-8.59*	5.84***	4.00***	-4.62***
LPSC			0.41*	0.21**		
INFL			0.02**	0.007*		
LEXPIM	0.24**	0.13**	0.53**	0.52***		0.14*
LODA			-0.21***	-0.10***		
LGOVCON	0.25***		0.54**			0.59***
LFDI		-0.03*				
LHEAL				-1.52***	3.21***	
CP1				0.04*		
CP3					0.13**	-0.07***
CP4	-0.07*	-0.04*		-0.07*	0.12*	-0.10***
N	15	15	14	14	14	14
R-Squared	0.893	0.557	0.933	0.935	0.891	0.966

Source: Author's calculations (2015); ***, **, *, indicate statistical significance at the 1, 5, and 10 percent levels, respectively; LRGDP – log Real Gross Domestic Product; LRGDPPC- log Real Gross Domestic Product per capita; LGFCF – log of Gross Fixed Capital Formation (as % of GDP); LAGRC – log of Agriculture sector; LINDUS – log of Industry sector; LSERV – log of services sector; LM3 – log Liquid Liabilities (as % of GDP)
(see Appendix A for description of control variables)

Before the implementation of the Comprehensive Reform Program in 1997, the regression results of models 5.1- 5.6 for equations 3.2.2a and 3.2.2b for the period 1983-1996 show that bank credit to the private sector has a positive and significant relationship with capital investment (at the 10% significance level) and growth in the agriculture sector (at the 5% significance level), despite its insignificant influence on overall economic growth and development (see Table 4.25). Trade openness and government expenditure show positive and significant relationships with capital investment, growth in the service sector and overall growth; while trade openness is important for growth in the agriculture sector. The results show mixed results on the impact of human capital investment on the major sectors of the economy; however, the negative relationships imply these indicators are not important during the early stages of economic growth in the country, and there could be other factors that influence growth. The occurrence of cyclones has a negative impact on the economy; specifically on the growth of the agriculture and service sectors with the occurrence of three to four cyclones occurring in the year. This has a negative impact on economic growth and development.

Table 4 26 Regression Results of the Growth Model using Private Sector Credit as the Independent Variable from 1997-2013 (Equations 3.2.2a and 3.2.2b)

	Dependent Variables

	LRGDP (Model5.1)	LRGDPPC (Model5.2)	LGFCF (Model5.3)	LAGRIC (Model5.4)	LINDUS (Model5.5)	LSERV (Model5.6)
C	3.19***	6.41***	-20.95***	-1.31	-1.68	1.41*
LPSC	-0.12***	-0.26***	-0.69***	-0.36***	0.68*	-0.19***
LEXPIM	0.24***	0.28***	1.47***	0.33***		0.23***
LODA	0.14***			0.34***	-0.75*	0.27***
LGOVCON	0.15***	0.21***	1.0***		0.69**	0.15***
LFDI	-0.18***		-0.32**	-0.39***	0.94*	-0.30***
LHEAL	0.58***	0.73***		1.12***	-1.20*	0.71***
LEDUC				0.93**		
CP1						0.02**
CP2	-0.02*			-0.03*		
N	17	17	17	17	17	17
R-Squared	0.998	0.906	0.952	0.980	0.866	0.997

Source: Author's calculations (2015); ***, **, *, indicate statistical significance at the 1, 5, and 10 percent levels, respectively; LRGDP – log Real Gross Domestic Product; LRGDPPC- log Real Gross Domestic Product per capita; LGFCF – log of Gross Fixed Capital Formation (as % of GDP); LAGRC – log of Agriculture sector; LINDUS – log of Industry sector; LSERV – log of services sector; LM3 – log Liquid Liabilities (as % of GDP)
(see Appendix A for description of control variables)

Following the implementation of the Comprehensive Reform Program, the regression results of models 5.1- 5.6 for equations 3.2.2a and 3.2.2b for the period 1997-2013 show that bank credit to the private sector has a positive and significant relationship with growth in the industry sector at the 10% significance level, mainly supported by the high lending to the construction sector, and housing and land purchases (see Table 2.4). The negative relationship of growth in other sectors, including capital investment, could be explained by the over-crowding of bank credit by the increase in aid into the country during this period to support donor-funded development projects. Further, factors other than financial development may have a greater influence on growth post-CRP implementation. The results show trade openness and government expenditure are significantly important for capital investment, with government expenditure showing a greater role in this period than in the previous period. Aside from the important role played by government expenditure, another positive impact of the post-CRP implementation is overseas aid supporting growth in the agriculture and service sectors and therefore overall growth. As in the previous period, the results also show an overall positive impact of human capital investment on the major sectors of the economy, specifically the health indicator on economic development and growth. Despite the insignificant results on the relationship with other sector growth, the results for the post CRP implementation (1997-2013) period also show a negative impact of the occurrences of cyclones (in this case, the occurrence of two cyclones during the year) on growth and the agriculture sector.

Chapter 5

Discussion and Conclusion

This study provided evidence on financial intermediation and financial deepening in Vanuatu's economy, and evidently the size of the banking sector that has grown over the last 32 years from 1982-2013. The trend in private sector credit, liquid liabilities and total financial assets of the banking system of Vanuatu has increased tremendously in the period leading up to 2013. This implies that financial development (through commercial banking) has a positive impact on economic growth which supports similar findings by King and Levine (1993a, 1993b), and Levine et al. (2000). However, banking inefficiency related to evidence of high interest rate spreads (during the 32-year period) as a result of high borrowing rates over the deposit rates of banks, may have been detrimental for growth. This confirms similar findings by Abubakar and Gani (2013) who investigated the banking sector reforms in the real sector in Nigeria over a 30 year period. However, our study may have less scope to identify whether this inefficiency (higher interest rate spread means high borrowing rates) could potentially limit the number of loanable funds into the productive sectors or whether the high inefficiencies are a matter of policy issue or high bank regulations. Thus, further study could be carried out to clarify the determinants of banking inefficiencies in Vanuatu and generally for the small Pacific Island Countries.

Our study shows a positive and significant relationship between financial development and economic growth, however lagged by a two year period. We can conclude that private sector credit (lagged by two years) has a positive and significant relationship with growth at the 1% significance level; the positive and significance relationship between liquid liabilities (lagged by two years) and growth at the 1% significance level; the positive and significant relationship between total financial assets of the banking system (lagged by two years) and growth at the 5% significance level (despite a negative relationship noted for the current period); and the negative and significant relationship between interest rate spread as an indicator of bank inefficiencies (both current and lagged impact) and growth at the5% significance level. These results imply that financial development is important for Vanuatu's economic growth and the lagged positive and significant relationship with growth is evident. The lagged impact of financial development on growth relates to the general perspective of developing countries with a slower pace of financial development compared to developed countries, and related to the high over-head cost of commercial banks' operations and low competition amongst banks (Deidda & Fattouh, 2002). The lagged impact is also explained by the weak monetary policy transmission mechanism found in the small Pacific Island Countries, including Vanuatu, which have underdeveloped money-markets (Dunn, Davies, Yan, Wu, & Wang, 2011). Jayaraman and

Choong (2012)also conclude that in these underdeveloped money markets, monetary aggregate is more important than short-term interest rate as a channel in transmitting impulses from the monetary sector to the real sector. Aside from the impact of financial development alone, our study identified that other control variables also play an important role in Vanuatu's economic growth. These factors include capital accumulation and investment, trade openness, overseas donor aid into the country and human capital accumulation. Likewise, it justifies the negative impact of natural disasters, in the case of tropical cyclones, and the detrimental effect of increased inflation on economic growth.

For further justification of the positive impact of finance on growth, our study shows the existence of short-run and long-run causality between the financial development and economic growth for Vanuatu. The results show that short-run causality runs from financial development to growth with positive and significant causality running from private sector credit (lagged by two years) to growth at the 5% level. The Wald coefficient tests show that in terms of the financial development and economic growth relationship, there is a uni-directional causality between private sector credit and real GDP growth, but there is no bi-directional causality. This means that for Vanuatu, the direction of causality runs from financial development to economic growth and justifies similar findings on developing countries by Christopoulous and Tsionas (2004). It follows the 'supply-side' view of the finance-growth relationship identified by Robinson (1952) that financial development has a positive effect on growth.

On the other hand, the Johansen cointegration test results provide evidence of long-run equilibrium relationships between financial development, growth and the selected set of control variables. The increase in the ratio of liquid liabilities to GDP leads to an increase in growth in the long-run. On the other hand, the error-correction coefficient shows the ratio of private sector credit to GDP has a negative and statistically significant relationship with GDP growth in the long-run and is the only financial development variable (including overseas donor-aid) that exhibits the expected negative and statistically significant relationship with growth at the 5% significance level. This means a shock to the short-run equilibrium is adjusted to the long-run, so therefore adjustments to the long-run are taking place. These findings mean that financial development has a short-run and long-run impact on growth (although differentiated by different indicators), thereby supporting the importance of financial development in the formulation of policies that support a sustainable growth.

The impact of the implementation of the Comprehensive Reform Program (CRP) in mid-1997 was expected to focus on renewing the institutions of governance, redefining the role of the public sector, improving public sector efficiency and encouraging the private sector to lead growth and improve social equity. The findings from our study show that before the implementation of the CRP (1982-1997), bank credit to the private sector had a positive and significant relationship with capital

investment and growth in the agriculture sector, despite having an insignificant influence on the overall economic growth and economic development. This implies that bank credit was important for business-financing following the country's independence in 1980 and its important role in supporting the agriculture sector as one of the main productive sector of the economy. However, the high volatility in growth during that period was caused by high inflationary pressures, a high trade deficit, and a high number of tropical cyclones. The results show the impact of financial development on growth after the implementation of the CRP confirms some of the findings by Gay (2004) that the CRP reform had little effect on growth. The impact of the increase in the ratio of liquid liabilities to GDP has a negative and significant relationship with real GDP per capita growth and capital investment. This implies that the CRP implementation may not have delivered its proposed objective in supporting the private sector growth. The impact of the increase in private sector credit (as a per cent of GDP) has a negative and significant relationship with all the growth variables, including capital investment and growth in the agriculture and service sectors (at the 1% significance level, respectively). The negative impact confirms similar findings by Gay (2004) that the CRP did not cover grants or loans to fund the productive sectors in order to boost export-oriented outputs and the lack of finance constraints by local ni-Vanuatu entrepreneurs to access credit, and this was partly due to the lack of historical borrowing records.

This current study findings along with other literatures show some important characteristics about future economic and financial reforms for small developing island countries like Vanuatu. First, the challenge in putting forward the right reform policy is important in order to meet its objectives and ensure its impacts are transmitted to the sectors of the economy and to avoid systematic crises that could be detrimental for both financial development and economic growth. These reforms should support and develop a well-functioning financial system, securing its financial soundness that supports raising savings and investment levels, increases growth and improves macroeconomic stability. Second, a detailed understanding of the background and development issues of Vanuatu provides the opportunity to shape reform policies for future sustainable growth and prospects that can be related to other small Pacific Island Countries with similar characteristics and challenges. The dispersion of the population and income inequality make the capital Port Vila the main centre where all the foreign-aid ends up. The average 30 percent of the total population who live in towns accounts for a vast majority of the cash economy while the rest of the population lives in a subsistence lifestyle in the outer islands. Aside from this, the instability of exports and Vanuatu's vulnerability to earthquakes and tropical cyclones contribute to the volatility of the country's economic output and as a result, credit creation in the economy may not increase quickly and the country is faced with periods of major inflationary pressures. Although there is evidence of financial development having a positive impact on Vanuatu's economic growth, the lagged impact could be associated with these existing challenges faced by small Pacific Island Countries like Vanuatu. These

difficulties include a weak and fragmented production base, high commodity volatility and a narrow range of exports. Financial development in small Pacific island Countries is also subject to problems such as lack of competition that result in high prices, high transport costs and high prices for key services (Winters and Martin (2004); Duncan et al. (1999)).

This study leads the way forward for further studies in this area. A vigorous research on the financial development and growth relationship using 32 annual data time-series specifically from the commercial banking sector (formal financial intermediaries) for Vanuatu could be enhanced if a longer time-span data is used. Subject to data availability, this research could include a high frequency data such as quarterly level time-series analysis (the current study is limited to annual level data availability), and considering other aspects of financial development such as micro-credit financing, offshore banking operations and other financial institutions to assess their impact on the overall banking system and growth. Furthermore, a qualitative (demand-side) survey can be carried out as a follow-up to this study to identify the transmission mechanism of financial development into the real sector.

In conclusion, the findings of this research show that there is a positive and significant relationship between the indicators of financial development and economic growth, however lagged by a two year period. This means that the transmission mechanism to the real sector could be slow and minimal. The lagged impact could be related to the fact that Vanuatu, like other small Pacific Island Countries has an underdeveloped money market, no secondary market and its financial system may have a weak monetary policy transmission mechanism. The study findings also show that there is a short run causality running from financial intermediation to economic growth, which means Vanuatu's financial sector follows a supply-view where financial intermediation causes economic growth; thus the importance of bank credit to the private sector for the development of enterprises is important. There is a long-run causality between financial deepening to economic growth, and shocks to private sector credit in the short run that will adjust towards its long-run equilibrium. Finally, the study findings show the reform policies implemented by the Comprehensive Reform Program in 1997 have had little impact on overall economic growth and major economic sector growth post-1998. The literature suggests that this weak impact is primarily due to contracting policy objectives that do not meet the aims of the reform, apart from other challenges that discourage growth. Therefore, reform policies should be implemented with a careful understanding of the financial system and the real sector, and the need to consider and address the challenges faced by small Pacific Island Countries like Vanuatu.

Appendix

Appendix A Data Variables

A.1 Variables description

Variable	Description	Indicator of…
LRGDP	Log of Real Gross Domestic Product – Total value of goods and services produced in the economy	Economic Growth
LRGDPPC	Log of Real Gross Domestic Product per capita – Total value of goods and services produced in the economy divided by population	Economic Development
LPSC	Log of private sector credit (as a percentage of Real GDP) by the commercial banks – Financial resources provided to the private sector by domestic money banks as share of GDP	Credit allocation by the commercial banks
LM3	Log of liquid liabilities (as a percentage of Real GDP) by the commercial banks (M3) – The sum of currency and deposits in the central bank (M0), plus transferable deposits and electronic currency (M1), plus time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements (M2), plus travellers cheques, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds held by residents.	Financial deepening
LTFA	Log of total financial assets of the banking system – total assets of the domestic banking system	Size of the commercial banking system
INSP	Interest Rate Spread (%) → lending rate minus deposit rate (%)	Efficiency of the banking system
LGFCF	Log of Gross Fixed Capital Formation	Capital accumulation and Investment
LEXPIM	Total Exports plus Total Imports → total exports plus imports	Trade Openness
LINFL	Inflation rate (%)	Macroeconomic stability
LODA	Log of Overseas Development Assistance into the country	Aid for development
LGOVCON	Log of Government Consumption Expenditure	Project financing
LFDI	Log of Foreign Direct Investment into Vanuatu	Project financing
LHEAL	Log of number of years of life expectancy	Human capital investment
LEDUC	Log of Gross of secondary school enrolment	Human capital investment
LEDUC1	Log of Gross of primary school enrolment	Human capital investment
CP1	Dummy Variable: 1 indicate occurrence of one cyclone in a year, 0 meaning none	Impact of natural disaster
CP2	Dummy Variable: 1 indicate occurrence of two cyclones in a year, 0 meaning none	Impact of natural disaster
CP3	Dummy Variable: 1 indicate occurrence of three cyclones in a year, 0 meaning none	Impact of natural disaster

CP4	Dummy Variable: 1 indicate occurrence of four cyclones in a year, 0 meaning none	Impact of natural disaster

Appendix B

Model Specifications

B.1 Growth Model 1 – Real GDP (LRGDP)

	Growth model of Equation 3.2.2
Model 1.0	$\log(RGDP_t) = \beta_0 + \beta_1 \log(FD_{t)} + \beta_2 \log(GFCF_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(CPI_t) + \beta_5 \log(ODA_t) + \beta_6 \log(GOVCON_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$
Model 1.0.1	$\log(RGDP_t) = \beta_0 + \beta_1 \log(PSC_t) + \beta_2 \log(M3) + \beta_3 logTFA_t) + \beta_4 INSP_t) + e_t$
Model 1.0.2	$\log(RGDP_t) = \beta_0 + \beta_1 \log(PSC_t) + e_t$
Model 1.0.3	$\log(RGDP_t) = \beta_0 + \beta_1 \log(M3_t) + e_t$
Model 1.0.4	$\log(RGDP_t) = \beta_0 + \beta_1 \log(TFA_t) + e_t$
Model 1.0.5	$\log(RGDP_t) = \beta_0 + \beta_1 \log(INSP_t) + e_t$
Model 1.1	$\log(RGDP_t) = \beta_0 + \beta_1 \log(PSC_{t)} + \beta_2 \log(GFCF_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(CPI_t) + \beta_5 \log(ODA_t) + \beta_6 \log(GOVCON_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$
Model 1.2	$\log(RGDP_t) = \beta_0 + \beta_1 \log(M3_{t)} + \beta_2 \log(GFCF_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(CPI_t) + \beta_5 \log(ODA_t) + \beta_6 \log(GOVCON_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$
Model 1.3	$\log(RGDP_t) = \beta_0 + \beta_1 \log(TFA_{t)} + \beta_2 \log(GFCF_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(CPI_t) + \beta_5 \log(ODA_t) + \beta_6 \log(GOVCON_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$
Model 1.4	$\log(RGDP_t) = \beta_0 + \beta_1 \log(INSP_{t)} + \beta_2 \log(GFCF_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(CPI_t) + \beta_5 \log(ODA_t) + \beta_6 \log(GOVCON_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$

B.2 Growth Model 2 – Real GDP Per Capita (LRGDPPC)

Model 2.0	$\boldsymbol{\log(RGDPPC_t) = \beta_0 + \beta_1 \log(FD_{t)} + \beta_2 \log(GFCF_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(CPI_t) + \beta_5 \log(ODA_t) + \beta_6 \log(GOVCON_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t}$

Model 2.0.1	$\log(RGDPPC_t) = \beta_0 + \beta_1 \log(PSC_t) + \beta_2 \log(M3) + \beta_3 logTFA_t) + \beta_4 INSP_t) + e_t$
Model 2.0.2	$\log(RGDPPC_t) = \beta_0 + \beta_1 \log(PSC_t) + e_t$
Model 2.0.3	$\log(RGDPPC_t) = \beta_0 + \beta_1 \log(M3_t) + e_t$
Model 2.0.4	$\log(RGDPPC_t) = \beta_0 + \beta_1 \log(TFA_t) + e_t$
Model 2.0.5	$\log(RGDPPC_t) = \beta_0 + \beta_1 \log(INSP_t) + e_t$
Model 2.1	$\log(RGDPPC_t) = \beta_0 + \beta_1 \log(PSC_{t)} + \beta_2 \log(GFCF_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(CPI_t) + \beta_5 \log(ODA_t) + \beta_6 \log(GOVCON_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$
Model 2.2	$\log(RGDPPC_t) = \beta_0 + \beta_1 \log(M3_{t)} + \beta_2 \log(GFCF_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(CPI_t) + \beta_5 \log(ODA_t) + \beta_6 \log(GOVCON_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$
Model 2.3	$\log(RGDPPC_t) = \beta_0 + \beta_1 \log(TFA_{t)} + \beta_2 \log(GFCF_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(CPI_t) + \beta_5 \log(ODA_t) + \beta_6 \log(GOVCON_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$
Model 2.4	$\log(RGDPPC_t) = \beta_0 + \beta_1 \log(INSP_{t)} + \beta_2 \log(GFCF_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(CPI_t) + \beta_5 \log(ODA_t) + \beta_6 \log(GOVCON_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$

B.3 Model 3 – VECM Model

Model 3.0	$\boldsymbol{log(DRGDP_t) = \beta_0 + \beta_1 log(DM3_{t)} + \beta_2 log(DPSC_t) + \beta_3 log(DEXPIM_t) + \beta_5 log(DODA_t) + \beta_6 log(DGOVCON_t) + e_t}$
Model 3.1	$\log(DRGDP_t) = \beta_0 + \beta_1 \log(DM3_{t-1)} + \beta_1 \log(DM3_{t-2)} + \beta_2 \log(DPSC_{t-1}) + \beta_2 \log(DPSC_{t-2}) + \beta_3 log(DEXPIM_{t-1}) + \beta_3 log(DEXPIM_{t-2}) + \beta_5 \log(DODA_{t-1}) + \beta_3 log(DODA_{t-2}) + \beta_6 \log(DGOVCON_{t-1}) + \beta_6 \log(DGOVCON_{t-2}) + e_t$

B.4 Model 4 – Model Showing Impact on Sectorial Growth (Liquid Liabilities as the Independent Variable)

Model 4.1	$\boldsymbol{log(RGDP_t) = \beta_0 + \beta_1 log(M3_{t)} + \beta_2 log(INFL_t) + \beta_3 log(EXPIM_t) + \beta_4 log(ODA_t) + \beta_5 log(GOVCON_t) + \beta_6 log(FDI_t) + \beta_7 log(HEAL_t) + \beta_8 log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t}$
Model 4.2	$\log(RGDPPC_t) = \beta_0 + \beta_1 \log(M3_{t)} + \beta_2 \log(INFL_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(ODA_t) + \beta_5 \log(GOVCON_t) + \beta_6 \log(FDI_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$
Model 4.3	$\log(GFCF_t) = \beta_0 + \beta_1 \log(M3_{t)} + \beta_2 \log(INFL_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(ODA_t) + \beta_5 \log(GOVCON_t) + \beta_6 \log(FDI_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$

Model 4.4	$\log(AGRIC_t) = \beta_0 + \beta_1 \log(M3_{t)} + \beta_2 \log(INFL_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(ODA_t) + \beta_5 \log(GOVCON_t) + \beta_6 \log(FDI_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$
Model 4.5	$\log(INDUS_t) = \beta_0 + \beta_1 \log(M3_{t)} + \beta_2 \log(INFL_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(ODA_t) + \beta_5 \log(GOVCON_t) + \beta_6 \log(FDI_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$
Model 4.6	$\log(SERV_t) = \beta_0 + \beta_1 \log(M3_{t)} + \beta_2 \log(INFL_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(ODA_t) + \beta_5 \log(GOVCON_t) + \beta_6 \log(FDI_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$

B.5 Model 5 – Model Showing Impact on Sectoral Growth (Private Sector Credit as the Independent Variable)

Model 5.1	$\boldsymbol{\log(RGDP_t) = \beta_0 + \beta_1 \log(PSC_{t)} + \beta_2 \log(INFL_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(ODA_t) + \beta_5 \log(GOVCON_t) + \beta_6 \log(FDI_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t}$
Model 5.2	$\log(RGDPPC_t) = \beta_0 + \beta_1 \log(PSC_{t)} + \beta_2 \log(INFL_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(ODA_t) + \beta_5 \log(GOVCON_t) + \beta_6 \log(FDI_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$
Model 5.3	$\log(GFCF_t) = \beta_0 + \beta_1 \log(PSC_{t)} + \beta_2 \log(INFL_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(ODA_t) + \beta_5 \log(GOVCON_t) + \beta_6 \log(FDI_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$
Model 5.4	$\log(AGRIC_t) = \beta_0 + \beta_1 \log(PSC_{t)} + \beta_2 \log(INFL_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(ODA_t) + \beta_5 \log(GOVCON_t) + \beta_6 \log(FDI_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$
Model 5.5	$\log(INDUS_t) = \beta_0 + \beta_1 \log(PSC_{t)} + \beta_2 \log(INFL_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(ODA_t) + \beta_5 \log(GOVCON_t) + \beta_6 \log(FDI_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$
Model 5.6	$\log(SERV_t) = \beta_0 + \beta_1 \log(PSC_{t)} + \beta_2 \log(INFL_t) + \beta_3 log(EXPIM_t) + \beta_4 \log(ODA_t) + \beta_5 \log(GOVCON_t) + \beta_6 \log(FDI_t) + \beta_7 \log(HEAL_t) + \beta_8 \log(EDUC_t) + \beta_9 PC1_t + \beta_{10} PC2_t + \beta_{11} PC3_t + \beta_{12} PC4_t + e_t$

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